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*The revised and updated version of this book is being provided in digital format. Each Chapter will be
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As pharmacists, we (Don Goldberg and Arnie Gitomer) have a healthy respect for drugs and their benefits. When we were in pharmacy school, however, there was still a great deal of awareness that a large number of the drugs listed in the pharmacopeia were derived from natural sources. A substantial amount of the curricula back then was devoted to subjects such as pharmacognosy, the study of natural substances, particularly plants, that are used in medicine. Over the years, however, courses of this type have been dropped from most pharmacy schools.

Why? Advances in chemistry enabled the pharmaceutical industry to synthesize ever more powerful drugs. We were less dependent on natural products as sources of lifesaving therapeutic agents. Instead, we looked to the chemist's lab bench.

There were good reasons for this movement away from natural products. Supply problems were alleviated. Greater potency could be achieved. The drugs were more easily standardized, and they could often be made available in a more reproducible, convenient form.

And we cannot ignore the economic incentive. A drug derived from a natural substance cannot be patented. A synthesized chemical drug, on the other hand, can be patented, giving the pharmaceutical company an opportunity to recoup the cost of Food and Drug Administration approval, and earn a handsome profit for seven or more years.

As is usually the case, unfortunately, there is no such thing as a free ride. Along with this increased potency comes increased toxicity and the potential for undesirable side effects. When deciding on the treatment for a health problem, a choice has to be made. We have to evaluate the benefit versus the risk of the various options available to us. Killing a fly with a shotgun blast will work, but using a fly swatter might work equally well, without such extensive collateral damage.

In our opinion, the medical establishment became enamored with high-tech, high-powered solutions to many of the health problems facing us today and lost sight of the fact that more gentle, less toxic alternatives were available. There are times when a fly swatter is actually all that is needed.

And even better, put screens on the windows! In other words, prevention—prevent the fly from entering in the first place. Too often, I will hear a patient complaining that "the doctor gave me this prescription, and now I feel worse than I did before." Or the doctor says, "Your blood pressure is a little high—have this prescription filled!"

According to recently released medical guidelines, almost everybody should be taking a "statin" drug to bring their cholesterol levels down to the recommended levels. Is elevated cholesterol or heart disease caused by a deficiency of "statin" drugs? Is arthritis caused by a deficiency of aspirin?

It has been said that we are experiencing an increase in diabetes of almost epidemic proportions. Heart disease, obesity, and cancer are rampant. Is this because we have not yet developed newer or more powerful drugs? Of course not.

Instead, these serious health problems are related to changes in our lifestyles and environment. We do not eat healthy food, we do not get enough exercise, and we are exposed to pollutants and toxins that did not exist in our grandparents' time. We live longer, but not healthier.

It's easy to respond with an admonition to just eat the right foods, prepared properly, get more exercise, and move out of the city. This would be fine, and it is an appropriate goal to strive for, but it's obviously a goal that cannot be achieved by the average person.

We consider nutritional supplements and herbal medicines to be a valuable compromise, or a bridge, between the two extremes—unrealistic lifestyle changes and reliance on miracle drugs. These agents can provide us with the healthy components of foods in quantities that might be difficult or impossible to get through diet alone. They also provide those natural agents that, when ingested at higher levels, exert therapeutic action with fewer side effects than more powerful, synthetic drugs. They offer a convenient and effective way to augment our diet with agents that have been shown to ward off the onset of aging, cancer, heart disease, Alzheimer's disease, osteoporosis, birth defects—nearly all health problems.

The benefits of nutritional supplementation are now being recognized not only by the general public, but also by the medical community. Interest in these alternative "remedies" is at the highest level ever. Everybody is looking for more information on which supplements to use and how to use them. Factual answers to these questions can
be hard to find. Unfounded and exaggerated claims are easy to find. That is why we are writing this book.
The information we provide is designed to help you distinguish fact from hype. We want to help you choose the
best supplements for your health.
This book is not intended to be used as a replacement for professional medical advice. Instead, it is meant to help you understand the benefits associated with the use of nutritional and herbal supplements and advise you about how best to use these supplements.

The book is divided into two parts. In Part One, we will discuss what nutritional supplements are and the reasons for taking them. First, we will take you through a series of steps that will help you choose the right type of supplement. We will then teach you how to tailor a supplement program to your own unique health needs. And we will review how to best use the supplements you have chosen. We will also teach you how to tell the difference between a good supplement and a bad one, and how to separate unfounded marketing hyperbole from sound nutritional advice. We suggest you read through Part One in its entirety.

In Part Two, we will present information on specific dietary supplements. We have drawn this information from a variety of sources, including those listed in the bibliography. Some of the information is based on recent scientific study and some is based on traditional and historic usage patterns. We have tried to indicate the degree of reliability when appropriate.

In Chapter 5, we provide information on individual nutrients and herbs. Representative products are provided as well, with educational and evaluative annotations when appropriate.

In Chapter 6, we provide a selection of popular combination remedies designed for specific health conditions. Representative products are listed, with ingredient information when possible.

The mention of specific products is for educational purposes only and is not an endorsement. Similar products are available from numerous additional sources. By providing you with examples and pointing out their strengths and deficiencies, we hope to enable you to make better decisions when evaluating which products to purchase on your own. To make it easier for you to find those products and categories that pertain to your personal needs, we have provided a "Therapeutic Cross-Reference." Additional references and Internet links can be found on our website, www.bestsupplementsforyourhealth.com.
CHAPTER FIVE: Individual Nutrients and Herbs

In this chapter, we will provide information on individual nutrients and herbs. Each listing will provide the following information:

- Related Items. Other nutrients of similar or related composition.
- Description. A general description of the nutrient or herb.
- Uses. A discussion of the item’s function and properties.
- Indications. A listing of health conditions for which the nutrient or herb may be useful.
- Dosage. How much and how often to use the nutrient.
- Cautions. Cautions or contraindications specific to the nutrient.
- Products. Representative examples of retail products. The company, product name, potency, and size are provided.*

* Product examples, initially, will consist of those present in the original 2002 edition of The Best Supplements For Your Health. We will update those listings as quickly as possible. You are welcome to contact the pharmacists and nutritionists at Willner Chemists for immediate assistance. 1-800-633-1106.

If you want information about a particular nutrient, look it up alphabetically in the chapter. If you have a specific health concern and want to find out which nutrients might be indicated, look in the therapeutic cross reference at the end of this chapter. Then check the appropriate listings in the chapter.

5-HTP

Related Item: Tryptophan.
Description: 5-hydroxytryptophan (5-HTP) is a neurotransmitter used by the body to make serotonin and melatonin. In supplements, 5-HTP is extracted from the seed of the plant Griffonia simplicifolia.
Uses: As a precursor to serotonin, 5-HTP may induce sleep, as well as influence mood. It has been recommended for mild depression and as an appetite suppressant. Increasing serotonin results in increased melatonin, the natural hormone that regulates the body’s sleep cycle.
Indications: Anxiety, depression, fibromyalgia, migraine headaches, seasonal affective disorder, weight loss, obesity, insomnia, headaches.
Dosage: Generally, 300 milligrams per day is recommended. For sleep, as little as 100 milligrams before bedtime may be sufficient. For weight loss, up to 600 milligrams or more daily may be required.
Cautions: Use caution if you are already taking antidepressant medication.
Products:
  Jarrow: 5-HTP, 100 mg, 60 capsules.
  Doctor’s Best: 5-HTP Best, 100 mg, 60 capsules.
  Allergy Research: 5-HTP, 50 mg, 100 capsules.
  Natrol: 5-HTP, 50 mg, 30 capsules.
  Country Life: 5-HTP Tryptophan, 50 mg, 50 capsules.
  Jarrow: 5-HTP, 50 mg, 90 capsules.

5-Hydroxytryptophan

See 5-HTP.
7-Keto DHEA

Related Item: DHEA.
Description: 7-keto DHEA is a metabolite of the hormone dehydroepiandrosterone (DHEA). Its chemical name is 3-acetyl-7-oxo-dehydroepiandrosterone.
Uses: DHEA is one of the primary adrenal steroid hormones, serving as, among other things, a precursor to estrogen and testosterone. 7-keto is not converted to these sex hormones.
For those who feel they would benefit from DHEA but fear the possible side effects of increased estrogen or testosterone production, 7-keto is offered as a substitute.
As we age, the production of DHEA and related hormones by the adrenal glands drops. It is thought that supplementing with these hormones may retard the aging process, boost the immune system, boost thermogenesis, and generally enhance the quality of life.
Indications: Anti-aging, obesity, weight loss, energy, low immune system, sexual performance, stress.
Dosage: For weight loss, the suggested dose is 100 milligrams, twice daily. For anti-aging purposes, from 25 to 100 milligrams daily is a general recommendation.
Cautions: 7-keto is chemically related to steroid hormones and long-term usage has not been studied for safety. Also, 7-keto may affect thyroid function, increasing T3 levels, so those with thyroid disorders should exert caution before using 7-keto or DHEA.
Products:
- Enzymatic Therapy: 7-Keto Naturalean, 100 mg, 30 capsules.
- Enzymatic Therapy: 7-Keto DHEA, 25 mg, 60 capsules.
- Twinlab: 7-Keto Maxilife, 25 mg, 60 capsules.
- Twinlab: 7-Keto Fuel, 50 mg, 30 capsules.

Acerola Vitamin C

Related Item: Vitamin C.
Description: Acerola is the fruit of the small shrub Malphigia glabra. The fruit contains a very high concentration of vitamin C.
Uses: A concentrate or extract of acerola can be used in supplements as a source of natural vitamin C. Although natural vitamin C is no different from synthetic vitamin C, there are other substances in acerola (flavonoids, other vitamins, minerals) that offer additional benefit.
Just as it is desirable to take vitamin C with bioflavonoids rather than vitamin C alone, it may be of some benefit to take vitamin C either from acerola or with acerola concentrate.
What is important is to be careful not to be misled about what is actually in the product. If it is a high-potency vitamin C supplement, it is unlikely to provide vitamin C only from acerola. Instead, it is more likely a mixture of acerola-derived vitamin C and synthetic vitamin C. Read the label carefully.
Products:
- Pure Encapsulations: Acerola Plus, 233 mg of vitamin C total, from 25.5 mg acerola extract, 6 mg ascorbyl palmitate, 200 mg ascorbic acid, with 150 mg hesperidin methylchalcone and 150 mg naringin, 120 vegicaps.

Acetyl-L-Carnitine

Related Item: Carnitine.
Description: Acetyl-L-carnitine is the acetyl ester of L-carnitine, commonly referred to as carnitine. As a supplement, it functions as a source of L-carnitine and acetyl groups.
For the cardioprotective action of carnitine, use a carnitine supplement rather than acetyl-L-carnitine. (See Carnitine for more information.) As a contributor of acetyl groups, however, acetyl-L-carnitine offers benefits not found with carnitine alone.

Uses: The acetyl component of acetyl-L-carnitine functions as a precursor for the formation of acetylcholine, one of the neurotransmitters in the brain thought to be involved in age-related dementias, including Alzheimer’s disease.


Dosage: Generally, 500 to 1,000 milligrams two or three times daily is recommended.

Products:
- Jarrow: Acetyl-L-Carnitine, 500 mg, 60 capsules.
- Twinlab: Acetyl-L-Carnitine, 500 mg, 30 capsules.
- Solgar: Acetyl-L-Carnitine, 250 mg, 30 vegicaps.
- Allergy Research: Acetyl-L-Carnitine, 500 mg, 100 capsules.

**Acidophillus**

See Probiotics.

**ALA**

See Lipoic Acid.

**Alkylglycerol**

Related Items: Shark liver oil, squalene.

Description: Alkylglycerols are fat-soluble substances found naturally in the spleen, liver, bone marrow, and breast milk. In dietary supplements, they are concentrated from shark liver oil.

Uses: Alkylglycerols from shark liver oil are often included in cancer treatment protocols. They may help reduce the side effects of conventional cancer therapy. They are also thought to enhance immune system function, raise white blood cell counts, and exert some anti-inflammatory action.

Indications: Cancer, immune system, arthritis, psoriasis, HIV.

Dosage: A general dose is about 500 milligrams of shark liver oil or 100 milligrams of concentrated alkylglycerols. For serious infections, cancer, or human immunodeficiency virus (HIV), complementary physicians sometimes use up to 1,500 milligrams daily.

Products:
- Amino Acid & Botanic Supply: Shark Liver Oil, 1,000 mg=200 mg, alkylglycerols, 60 softgels.
- Lane Labs: Immunofin, 250 mg shark liver oil, 20% G-E lipids, 60 softgels.
- Lane Labs: Immunofin, 250 mg shark liver oil, 20% G-E lipids, 120 softgels.
- Scandinavian Natural: Alkyrol, 250 mg=50 mg alkylglycerols per cap, 60 softgels.
- Scandinavian Natural: Alkyrol, 250 mg=50 mg alkylglycerols per cap, 120 softgels.
- Scandinavian Natural: Alkyrol, 500 mg =100 mg alkylglycerols per cap, 120 softgels.
- Solgar: Shark Liver Oil Complex, 500 mg=50 mg alkylglycerols per cap, 60 softgels.

**Aloe**

Description: Aloe (Aloe vera) is one of the oldest medicinal plants known to man. Different parts of the plant yield compounds with widely differing therapeutic actions.
Uses: There are two major parts of the aloe plant. A bitter latex is found in a layer of cells just under the outer rind of the leaves. The dried latex that is derived from this part of the leaf is a strong laxative. It contains anthraquinones (barbaloin, or aloin A & B, and aloe-emodin) that can exert a potent cathartic action. The aloe vera gel is derived from the inner, central part of the leaf. This mucilagenous liquid is the part used topically and internally for its healing, antimicrobial, and anti-inflammatory activity.

Unfortunately, there are several problems associated with aloe products. First, there is a paucity of studies supporting the many claims made for aloe, especially those associated with oral use. Second, there is still some question as to what the active ingredients are in aloe. In turn, this leads to a problem with standardization and potency of the various commercial products on the market. There is considerable variation in product composition from one brand to another. This makes it very difficult to distinguish between good products and bad. And third, the nomenclature and labeling of many aloe products is very confusing. It is often difficult to discern what is actually in the container by reading the label.

For example, contrary to some claims, there is no difference between the gel and the juice, except for the addition of thickening agents. When first taken from the plant, aloe gel is naturally viscous, or gel-like. But the enzymes naturally present in the gel cause it to become watery in a short time. So any product, regardless of whether it is labeled as a gel or juice, will contain thickeners (such as gums or starches).

Theoretically, a product labeled “aloe vera gel” should refer to the natural, undiluted gel obtained from the inner portion of the leaf. Without additives (preservatives), it would be difficult to package or store this material. An aloe vera concentrate should theoretically consist of the natural gel with the water removed. Neither of the two above-mentioned products would be appropriate for internal use. Aloe vera juice, which should be the gel diluted with water (usually up to 50 percent), would be the form appropriate for ingestion.

The most universally accepted use of aloe gel involves its external healing and soothing action on various skin disorders, including burns, wounds, and minor skin ailments. The discovery that aloe gel may contain prostaglandin precursor fatty acids such as gamma-linolenic acid (GLA) may explain why it appears to exert anti-inflammatory activity. This may explain, for example, why it proved helpful in treating psoriasis in one study.

Aloe gel juice is used internally for other types of problems, ranging from gastrointestinal upset to diabetes and ulcers. But again, there is currently little research to support this.

Further complicating matters is that some research indicates that the anthraquinones emodin and aloe-emodin may be effective against Helicobacter pylori, which is thought to cause gastric ulcer. But these substances, as already mentioned, are not supposed to be present in the aloe gel except in very small quantities. They are found in the latex, and at the appropriate dosage have powerful laxative action.

Some aloe products are labeled as “whole leaf.” What does that mean? Does it mean that it contains the bitter latex as well as the gel? Until some standardization of terminology and content is adopted, it remains difficult to make meaningful product recommendations. Some investigators have analyzed commercial aloe products and found that some contain no aloe (just maltodextrin), some contain a mixture of maltodextrin and aloe, and some are pure aloe.

Indications: Aloe vera gel, topical: Burns, wound healing, psoriasis. Aloe vera gel juice: Diabetes, gastrointestinal disorders. Aloe vera bitter latex: Constipation.

Cautions: There are two types of aloe products. The type that contains the bitter latex is a potent laxative. The aloe gel or juice products should not contain the laxative components of aloe. Do not confuse the two.

Aloe is a stimulant laxative and should be used with caution. It should not be used for a prolonged period of time, as this may cause dependence and impaired bowel function.

Products:

Nature’s Herbs: Aloe Vera Inner Gel, 250 mg aloe vera inner gel, 100 capsules. Note: This product is labeled as a “mild stimulant laxative,” with the appropriate warnings and cautions.

Nature’s Herbs: Aloe Vera Gel, 50 mg aloe vera gel, 200:1 extract, 50 softgels.

Lily of the Desert: Aloe Vera. Juice (aloin and aloe emodin removed), quart.
R Pur Aloe: Super Gelly (contains aloe vera gel), 4-oz gel.

**Alpha-Lipoic Acid**

See Lipoic Acid.

**American Ginseng**

Related Items: Ginseng, Siberian ginseng.

Description: There are several types of ginseng—different species of the same genus. According to Chinese medicine, American ginseng (Panax quinquefolis) is less stimulating, or less “yang,” than Asian ginseng (Panax ginseng). The main active ingredient are the ginsenosides.

Uses: Chinese medicine considers American ginseng to have different uses than Asian ginseng. Western medicine does not. If you are following a protocol of diagnosis and treatment based upon traditional Chinese medical philosophy, choose the type of ginseng dictated by that philosophy. For others—that is, for most of us—our suggestion is to consider the two as almost interchangeable. Historically, ginseng has retained a reputation as one of the premier general tonic herbs for more than 5,000 years. It is used as a tonic to revitalize and replenish vital energy. This does not mean you should expect the type of energy jolt you get from a dose of caffeine. The effect is more subtle, especially with American ginseng. It is a tonic that revitalizes the function of the organism as a whole, building resistance, reducing susceptibility to illness, and promoting health and longevity.

Dosage: For standardized extracts, the dose is 200 to 500 milligrams per day. For non-standardized concentrates, the dose is higher. For liquid tinctures, follow the directions on the label or use 2 to 3 milliliters three times a day. Indications: Immune system, athletic performance, energy low, anti-aging, cold & flu, erectile dysfunction, fertility (male), chronic fatigue syndrome, cancer, diabetes.

Cautions: American Ginseng may be contraindicated for persons with hypertension.

Products:
- Root to Health: American Ginseng, 500 mg Panax quinquefolius per capsule, 100 capsules.
- Solgar: American Ginseng Extract, 100 mg Panax quinquefolius root extract (10% ginsenosides), 200 mg Panax quinquefolius powder (5% ginsenosides), 15 mg ginsenosides total, 60 vegicaps.

**Androstenedione**

Related Item: DHEA.

Description: Androstenedione is a steroid hormone, naturally found in the adrenal glands. It is derived from DHEA and converted in the body to testosterone, estrone, and estradiol.

Use: It is used by bodybuilders and athletes in the belief that it increases blood levels of testosterone, which in turn leads to increased muscle. Whether or not it really exerts this action remains controversial.

Cautions: Prudence dictates that androstenedione supplementation is best undertaken only on the advice and guidance of a physician. Higher dosage levels should definitely not be used without medical supervision. The long-term effects of androstenedione supplementation are unknown. Those who are at risk for prostate, breast, uterine, or ovarian cancer should not take androstenedione. The most common adverse reactions seem to be androgenic effects, such as acne, and increased facial hair.

Products:
- Olympian Labs: Androstene Power, androstenedione, 50 mg, 90 capsules.
Antioxidants

Related Items: Vitamin E, vitamin C, selenium.

Description: Antioxidants, in general, are substances that can neutralize unstable molecules that can cause damage. In biological systems, we are concerned about damage to DNA, cell membranes, etc. These unstable molecules are sometimes referred to as “free radicals.”

One type of instability involves oxidation. Free radicals can do damage by acting as runaway oxidizing agents. Antioxidant nutrients can neutralize this potential hazard. They sacrifice themselves to protect other cells in the body from oxidative damage.

There are many, many antioxidant substances found in foods and supplements. In addition to the well-known vitamins and minerals (vitamin C, vitamin E, beta-carotene, and selenium), there are phyto-chemicals such as flavonoids, Lycopene, lutein, quercetin, catechins, polyphenols, OPCs, PCOs, anthocyanins—these are now being recognized as perhaps even more powerful antioxidants than vitamins C and E.

Equally important is the realization that the antioxidants usually function most effectively when used in combination. This may be why some studies show better results with antioxidant-rich foods than with isolated, or supplemental nutrients.

Products:
Willner Chemists, Antiox Phyto Complex II, Veggie Capsules
Willner Chemists, Antiox Phyto Blend, Liquid

Arginine

Description: Arginine is a semi-essential amino acid. In addition to the usual functions of amino acids in general, i.e. protein formation, arginine is involved specifically as a precursor to nitric oxide (NO), and the amino acids ornithine and proline.

Uses: Most of the reasons for using supplemental arginine relate to its role as a precursor to nitric oxide (NO). Nitric oxide is produced throughout the body, and plays an important role in cardiovascular system, immune system, and nervous system function.

Nitric oxide has been shown to reduce platelet stickiness and mononuclear cell adhesion, dilate blood vessels, and inhibit free radical production. It is, therefore, useful to those with atherosclerosis, elevated cholesterol levels, and other types of cardiovascular disease.

Because of the vasodilating action of nitric oxide, there is some interest in the use of arginine in treating erectile dysfunction. Research has also shown that arginine may be helpful in treating male infertility, improving sperm count and motility.

Arginine is also thought to be beneficial for improving wound healing, burns, and other types of trauma, as well as enhancing immune system function. There is ongoing interest in the use of arginine by those with various types of cancer, AIDS, and HIV infection.

High doses of arginine have been shown to increase levels of human growth hormone. It has been used by body-builders to increase muscle, reduce fat, and improve energy levels. Studies in this area have yielded mixed results. It is sometimes taken along with another amino acid, ornithine.

Indications: Cardiovascular disease, wound healing, athletic performance, erectile dysfunction, fertility (male), immune system.

Dosage: It should be noted that most of the research on arginine utilizes doses in excess of 5 to 10 grams daily. In treating cardiovascular and fertility problems, up to 20 grams a day may be recommended.

Doses of up to 15 grams daily seem to be well tolerated.

Cautions: The herpes simplex virus protein contains high levels of arginine. Some are concerned that supplemental arginine might in some way enhance or encourage the growth of the herpes simplex virus.
They caution against taking arginine supplements if you have recurrent oral herpes outbreaks. This concern is more speculative than factual, but bears mentioning nevertheless.

Products:
Solgar: Arginine, 500 mg, vegetarian and kosher, 250 vegicaps.
Jarrow: Arginine, 1,000 mg, 100 tablets.

Artichoke Leaf

Description: Artichoke leaf (Cynara scolymus) is an herb or herbal extract derived from the leaves of the globe artichoke. This is not the part normally eaten as a vegetable, which is the unopened flower head, or bud, and bracts. The leaves are found below the flower head, and are very bitter in taste.

Uses: The official use is for the treatment of dyspeptic problems, or indigestion. But most of the current interest in artichoke leaf involves its ability to stimulate bile production (choleretic), lower cholesterol, and protect the liver from damage by toxins and free radicals.

These actions are supported by clinical evidence. In the past, it was thought that the active ingredient in artichoke leaf was cynarin, but now it is felt that a combination of ingredients are responsible, including cynaroside and luteolin.

Standardized extracts, in capsule form, are available, as are liquid tinctures. Artichoke leaf is not usually prepared as a tea (infusion).

Indications: Cholesterol problems, indigestion, irritable bowel syndrome, liver disorders.

Cautions: Caution should be exercised if you have gallstones or bile duct blockage.

Products:
Nature’s Herbs: Artichoke Power, 100 mg, Std 15% caffeoylquinic acids; 375 mg artichoke pwd., 60 capsules.
Enzymatic Therapy: Artichoke Extract, 160 mg, Std 13-18% caffeoylquinic acids as cholerogenic acid, 90 capsules.
Nature’s Way: Artichoke Extract Standardized, 300 mg, Std 5% (15 mg) caffeoylquinic acids, plus 150 mg milk thistle, 60 capsules.
Flora: Cynarol, 500 mg, 11:1 concentrate, 40 softgels.

Ascorbic Acid

See Vitamin C.

Ascorbyl Palmitate

Related Items: Vitamin C, ascorbic acid.

Description: Vitamin C is a water-soluble vitamin and antioxidant. To convert vitamin C from a water-soluble substance to a fat-soluble substance, it can be chemically modified by reacting it with the long-chain saturated fatty acid palmitic acid. This results in an ester, ascorbyl palmitate, which is now fat-soluble.

Why is this important? If you want to incorporate vitamin C as an antioxidant in a fat-based food product, or oil, you need a form of vitamin C that will dissolve in oil. Ascorbyl palmitate, being fat-soluble, can be used in products of that type. It can also be used in topical skin creams and ointments, intended for cosmetic and therapeutic purposes.

Uses: In addition to its fat-solubility-related uses as an additive in foods and cosmetics, ascorbyl palmitate is thought to possibly offer some advantage as a nutritional supplement. If ascorbyl palmitate is absorbed intact, it may be more active in the lipid-rich parts of the body, such as the cell membranes, helping to lower LDL choles-
terol, etc. It may be more effective in regenerating vitamin E than vitamin C.

While interesting, these possible advantages of ascorbyl palmitate over regular vitamin C have yet to be proven.

*Indications: Skin conditions (topical), cholesterol problems.*

*Dosage:* The recommended daily allowance for vitamin C is 75 to 90 milligrams for nonsmokers and 110 to 125 milligrams for smokers. The amounts typically found in supplements provide 500 and 1,000 milligrams daily, although some claim that 200 milligrams are enough to ensure maximum tissue levels. Many take much higher amounts. Some, for example, take 4 to 5 grams daily to ameliorate the symptoms of a cold. Some research studies have used doses in the 5-gram-daily range. Daily intakes of up to 2 or 3 grams a day are generally considered benign. Too high a dose will result in diarrhea.

*Products:*
- Pure Encapsulations: Ascorbyl Palmitate, 214 mg ascorbic acid from 500 mg ascorbyl palmitate, 90 capsules.

### Ashwagandha

*Description: Ashwagandha (Withania somniferum) is a plant that is popular in Indian or Ayurvedic medicine. It belongs to the pepper family. The roots are used medicoally.*

*Uses: Many of the constituents of ashwagandha resemble those in Asian ginseng, and in fact, it seems to function as an adaptogen, a nonspecific tonic that strengthens the body’s ability to handle stress of all types. Ashwagandha is used for most problems affecting the immune system, as well as an anti-inflammatory for treatment of arthritis.*

*Indications: Immune system, stress, arthritis.*

*Products:*
- Nature’s Answer: Ashwagandha Root Alcohol Free, 2,000 mg ashwagandha fluid ext (1:1) per 2 ml, 2 fl oz.
- America’s Finest: Ashwagandha Root Extract, 300 mg, 1.5% withanolides, 4.5 mg, 60 capsules.
- Nature’s Herbs: Ashwagandha, 300 mg, 1.5% withanolides, 4.5 mg, 50 tablets.
- Solgar: Ashwagandha Root Extract, 300 mg, 1.5% withanolides, 5 mg, plus 100 mg ashwagandha rt pwd., 60 vegicaps.
- Solaray: Ashwagandha, 470 mg, 1.5% withanolides, 7 mg, 60 capsules.
- Herb Pharm: Ashwagandha Whole Root, organically grown; (1:4) dry herb/menstrum, 1 fl oz.

### Astragalus

*Description: Astragalus (Astragalus membranaceus) is a plant native to northern China. The portion of the plant used medicinally is the 4-7-year-old dried root.*

*Uses: Astragalus is one of the premier immune-enhancing, adaptogenic herbs known to Chinese medicine. It is thought to be especially valuable as a preventive agent, and for its ability to renew vitality and energy after an illness has passed.*

*It is perhaps the herb of choice, according to some, for treating serious illness, including cancer. Most of the research on astragalus is in Chinese, but it is currently under investigation as a cancer treatment and has been shown to also be especially beneficial in protecting the liver.*

*Indications: Cancer, immune system, liver disorders, stress, cold and flu, hepatitis.*

*Dosage: Available in capsule and tincture form, the recommended dosage is often high, typically 400 to 500 mg, eight times daily.*

*Products:*
- Nature’s Answer: Astragalus Root Alcohol Free, 2,000 mg astragalus root fluid Ext (1:1) per 2 ml, 1 fl oz.
Nature’s Herbs: Astragalus Power, 200 mg, 7% polysaccharides, plus 250 mg astragalus root, 60 capsules.
Solgar: Astragalus Root Extract, 225 mg, 0.5% triterpene glycosides (1 mg), plus 250 mg astragalus root, 60 vegicaps.
Nature’s Answer: Astragalus Root Extract, 250 mg, 0.3% astragalosides, plus 250 mg astragalus root, 60 vegicaps.
Nature’s Way: Astragalus Root, 470 mg astragalus root, 100 capsules. Note: This is a concentrate, not an extract.

**Barberry**

Description: Barberry (Berberis vulgaris) is an herb found in Europe and North America. The root and stem bark are used medicinally. It contains berberine, a compound also found in goldenseal and Oregon grape.
Uses: Thought to exert antimicrobial action, barberry has been recommended for chronic candidiasis, parasites, and other infections, but this is not supported by current research. There is some interesting speculation that it may be of value in treating ventricular arrhythmias and psoriasis, but again, strong supporting evidence is not yet available.
Indications: Immune system, psoriasis, candidiasis, ventricular arrhythmias, urinary tract infections.
Products:
Nature’s Answer: Barberry Root, 2,000 mg barberry fluid extract (1:1) per 2 ml, 1 fl oz.

**Barley Grass**

Related Items: Spirulina, green foods, wheat grass, chlorella, chlorophyll, blue green algae.
Description: Dried barley grass concentrates, like all green food supplements, are relatively rich in protein, chlorophyll, and carotenoids.
Uses: Green food concentrates of this type are claimed to have anti-cancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents. While convincing proof of all of these actions may be lacking, there is certainly no reason not to include one of the green food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antioxidants, and varying amounts of trace nutrients. The problem with these supplements is that exaggerated marketing claims often accompany the products, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.
Cautions: Green food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.
Products:
Nature’s Answer: Barley Grass, 900 mg organic barley grass per 3 vegicaps, 90 vegicaps.
Kyolic: Kyo Green Drink Powder, combination of young barley and wheat grasses with chlorella, brown rice, and kelp, 5.3 oz powder.
Green Kamut: Just Barley, dried juice from organic barley leaves, 80 g powder.
Green Foods: Green Magma Original Powder, dried juice from young barley leaves, 5.3 oz powder.

**Bee Pollen**

Related Item: Flower pollen.
Description: Bee pollen is plant pollen, the male germ seeds of plants, collected by worker bees. The bees combine the pollen with plant nectar and bee saliva. This material is then used as food for drone bees.
Uses: In spite of the fact that bee pollen has been a popular health food supplement for many years, there is little
justification for its use. There is even some question as to whether it has any value as a food for humans as the pollen grains may not be digestible. There is no support to early claims by athletes that it increased stamina and performance.

We suggest using flower pollen, rather than bee pollen.

Cautions: Bee pollen should be avoided by anyone who is allergic or hypersensitive to bee venom.

Products:
Nature’s Way: Bee Pollen Blend, 580 mg bee pollen from China and Europe, 100 capsules.
Nature’s Answer: Bee pollen, 1,000 mg high desert bee pollen per ml, 1 oz liquid.

**Beta-1,3-Glucan**

Description: Beta-glucan is a complex polysaccharide derived from the cell wall of certain yeasts, mushrooms, oat fiber, barley fiber, and seaweed. Depending on the source, it consists of a mixture of varying proportions of beta-1,3-glucan, beta-1,6-glucan, and/or beta-1, 4-glucan.

Uses: The primary use of this material is as an immune system modulator, and a cholesterol-lowering agent. Numerous studies show that the beta-glucans are effective in activating certain white blood cells. These white cells are essential for optimal immune system function, and are even involved in battling tumor cells. Some research indicates that beta-glucans modulate immune function without causing it to be overactive. This is valuable in treating auto-immune disorders such as rheumatoid arthritis.

Beta-glucans may be the component of soluble fibers such as oat bran responsible for lowering cholesterol levels.

Indications: Cancer, immune system, cholesterol problems.

Cautions: Persons with food allergies should be aware of the source of the beta-glucans in the supplement being used.

Products: We have provided a selection of products, but you will notice that the “potency” varies over a wide range, from 20 to 500 milligrams. What does that mean? We don’t know. In our opinion, there seems to be a lack of standardized terminology in this product category, making it very difficult to compare one product to another.

Natrol: Beta Glucans 20 mg, “Beta Precise,” beta 1,3 & 1,6 glucans, 20 mg, 30 capsules.
Nutrition Supply Corp: NSC 100 (Immunication), dSM beta 1,3/1,6 glucan 10 mg, micronized from Saccharomyces cerevisiae, 60 capsules.
Source Naturals: Beta Glucan, Purified beta 1,3 glucan, 7.5 mg, 60 capsules.
America’s Finest: Beta 1,3 Glucan, 500 mg, 100 capsules.

**Beta-Carotene**

Related Items: Carotenoids, lutein, lycopene, zeaxanthin, alpha-carotene, canthaxanthin, vitamin A.

Description: Beta-carotene is a yellow-orange plant pigment, which may be converted in the body to vitamin A. Beta-carotene is one of many carotenoids found in green vegetables and fruits, but is the one that is most readily converted to vitamin A.

Not all ingested beta-carotene is converted to vitamin A. The body uses only the amount needed, and the rest is stored. For this reason, beta-carotene is not as toxic as vitamin A, and larger amounts can be consumed with no harm to health.

Uses: Beta-carotene has two important functions. First, it can be converted to vitamin A by the body, as needed. Second, beta-carotene is a powerful antioxidant.

Numerous studies, over many years, indicated that people with the lowest intake of beta-carotene had the highest
incidence of cancer. In the mid-1990s, much to everyone’s surprise, studies were published showing that beta-carotene, in certain instances (among smokers), actually made cancer worse. The best explanation for this, so far, is that synthetic beta-carotene, the type used in those studies, does not function the same as natural beta-carotene, or perhaps even more to the point, natural mixed carotenoids.

On a supplement label, the synthetic form is identified only as “beta-carotene,” while the natural form is usually accompanied by “…from D. salina,” “…from algae,” or “…from palm,” etc.

Beta-carotene remains a powerful protective agent, effective against various types of cancer, heart disease, infections, and immune system problems. Some clinicians feel that beta-carotene is an essential component in the treatment for people with acquired immune deficiency syndrome (AIDS).

Indications: Cancer, cardiovascular disease, HIV, immune system, leukoplakia, night blindness, asthma, cataracts, macular degeneration, HIV.

Cautions: Large doses of beta-carotene, or other carotenoids, can produce a harmless, and reversible, yellowing of the skin. Smokers should avoid supplements containing synthetic beta-carotene, and high levels of isolated beta-carotene.

Products:
- Jarrow: Marine Beta Carotene, 25,000 IU, natural beta-carotene (D. Salina), 100 softgels.
- Solgar: Beta Carotene, 10,000 IU, natural beta-carotene, dry, vegetarian, 250 tablets.
- Solgar: Beta Carotene, 11,000 IU, natural beta-carotene from carrot oil 100 softgels.
- Twinlab: Carotene Caps, 25,000 IU, synthetic beta-carotene, dry, water dispersed, 120 capsules.

**Beta-Hydroxy Beta-MethylButyrate**

See HMB.

**Betaine**

Related Items: Choline, trimethylglycine, betaine hydrochloride.

Description: A substance closely related to choline. It functions, biochemically, as a methyl donor. It is also involved in the synthesis of the essential amino acid methionine from homocysteine.

Choline has four methyl groups. When choline reacts chemically, and donates one of those methyl groups to another molecule, it forms betaine (trimethylglycine). When betaine donates one of its methyl groups, it forms DMG (dimethylglycine).

Uses: In enhancing the conversion of homocysteine to methionine, which requires folic acid, vitamin B6, and vitamin B12, betaine may lower the risk of heart disease.

Betaine and choline may be involved in prevention of fatty liver, neurotransmitter function, and the metabolism of fat. Agents that facilitate the liver’s ability to process fats are called lipotropic agents.

The body manufactures choline from methionine, with the aid of folic acid and vitamin B12 as coenzymes. Another form of betaine often seen in supplement form is betaine hydrochloride. This form is usually used as a source of hydrochloric acid, for appropriate digestive problems, rather than as a source of betaine.

Indications: Cholesterol problems, liver disorders, cardiovascular disease.

Products:
- Jarrow: TMG-500, anhydrous betaine, 120 tablets.
- Jarrow: TMG Crystals, anhydrous betaine, 1 teaspoon equals 2.6 g, 50 g.
- Source Naturals: TMG 750 mg, 120 tablets.
Betaine Hydrochloride

Related Items: Betaine, trimethylglycine.
Description: A form of betaine that contains hydrochloric acid, intended for use as a digestive aid.
Uses: Betaine hydrochloride is intended for those with insufficient levels of stomach acid. Hydrochloric acid is normally secreted in the stomach, and is necessary for proper digestion of food. Betaine hydrochloride often comes in combination with pepsin, the proteolytic enzyme found in the stomach.
Some feel that certain health problems, such as food allergies, asthma, and candidiasis, are related to incomplete or inefficient digestion of protein.
A dose of 650 milligrams of betaine hydrochloride, or 10 grains, should be sufficient. Higher doses should be used only under the guidance of a physician.
Cautions: Discontinue use if a burning sensation (heartburn) is experienced unless advised otherwise by your physician.
Products:
Solgar: Beta Pepsin, betaine HCl, 325 mg; pepsin (1:10,000) 59 mg, 250 tablets. Caution: Do not take in cases of stomach or duodenal pain or history of ulcers.
Advanced Medical Nutrition: Betaine Hydrochloride, betaine HCl, 648 mg, 90 capsules. Does not contain pepsin. Do not use if gastric hyperacidity or peptic ulcers are present.
Twinlab: Betaine HCl, betaine HCl, 648 mg, pepsin (1:10,000) 130 mg, 100 capsules. Warning: Do not take on an empty stomach.

Beta-Sitosterol

Related Items: Phytosterols, phytostanols.
Description: Beta-sitosterol is a phytosterol, a compound found in plants that is chemically similar in structure to cholesterol, which is found only in animals. Beta-sitosterol is the most common type of phytosterol found in the diet. High levels of beta-sitosterol are also found in saw palmetto, pumpkin seed, and pygeum.
Uses: Beta-sitosterol most likely has cholesterol-lowering activity similar to that of the phytosterols and phytostanols in general. But the interest in beta-sitosterol is related more to its apparent role as a treatment of benign prostatic hyperplasia (BPH).
Indications: Benign prostatic hypertrophy, cholesterol problems.
Dosage: The amount varies with the nature of the product. In Europe, products containing between 20 to 130 milligrams of beta-sitosterol, three times daily, with meals, have been used. For maintenance, about one-half that amount is used. Substantially higher doses are used for cholesterol reduction.
Cautions: There is a possibility that beta-sitosterol interferes with the absorption of carotenoids, vitamin E, and lycopene.
Products:
Natrol: Beta Sitosterol, 120 mg beta sitosterol, 60 mg campesterol, 40 mg stigmasterol, 60 tablets.

Bilberry

Related Item: Bioflavonoids.
Description: Bilberry (Vaccinium myrtillus) is used as an herbal supplement because it is rich in anthocyanosides and other flavonoids, which are powerful antioxidants. Bilberry is closely related to the American blueberry. Today, the berries are used in the preparation of supplements, although the leaf was also used historically.
Uses: The anthocyanodin flavonoids in bilberry protect and maintain the tone of small blood vessels, thus enhancing the flow of oxygen-rich blood to areas such as the retina of the eye.

Because of this ability to enhance microcirculation, and protect against oxidative damage, bilberry appears to be valuable in preventing and treating many of the vision problems associated with aging, including cataracts and retinopathies (including diabetic retinopathy), along with, possibly, glaucoma and poor night vision.

There is also some evidence that bilberry anthocyanosides enhance the regeneration of rhodopsin, or visual purple, found in the rods of the eye. This might explain its effect on night vision.

All flavonoid-rich substances like bilberry have a tonifying effect on the circulatory system. It is used for easy bruising, hemorrhoids, varicose veins, spider veins, and before surgery to minimize bruising and excessive bleeding.

Wild bilberry produces small, astringent berries. Cultivated bilberry, however, produces a larger, sweeter berry that is almost identical to the North American blueberry (Vaccinium angustifolium). It might seem that blueberries and bilberries could be used interchangeably, then, and for many purposes, that might be correct. On the other hand, certain of the traditional uses, such as treating diarrhea with the dried berries, might be dependent to a degree on the wild berries’ astringent properties. Cultivated bilberry, or blueberry, would not be expected to be as effective.

Indications: Diabetes, retinopathy, cataracts, macular degeneration, night blindness, cardiovascular disease, diarrhea, hemorrhoids, varicose veins.

Dosage: A dose of between 160 and 320 milligrams daily, in divided doses, is usually recommended, although higher doses can be taken if necessary. A standardized (25% anthocyanosides) form is now most often used, in capsule form. Liquid extracts are also available.

Cautions: As is the case for most phytotherapeutic supplements of this type, bilberry has a slight blood-thinning effect. This is generally a beneficial property, but use caution if taking blood-thinning medications.

Products:
- Solaray: Bilberry One Daily, 160 mg bilberry extract providing 36% anthocyanosides, 30 capsules.
- Solgar: Bilberry Vegicaps, 60 mg bilberry extract providing 25% anthocyanosides, 100 mg bilberry powder, and 322 mg ginkgo leaf powder, 50 vegicaps.
- Scandinavian Natural: Strix, 80 mg bilberry extract providing 25% anthocyanosides, 60 tablets.
- Jarrow: Bilberry Grapeskin, 80 mg bilberry extract providing 25% anthocyanosides, and 200 mg grapeskin providing 30% polyphenols, 120 capsules. Note: this is actually a combination product, containing both bilberry and grapeskin, which we feel is complementary to the action of bilberry.

Biotin

Description: Biotin, also known as vitamin H, is a water-soluble B vitamin involved in the metabolism of protein, fat, and carbohydrates.

Uses: Biotin is thought to be useful in high doses for preventing brittle nails and hair loss. It may be useful in diabetes, enhancing glucose metabolism and preventing diabetic neuropathy.

Indications: Skin disorders, hair, skin, and nails, diabetes.

Dosage: The recommended daily value for biotin is 300 micrograms.

Cautions: There are no known toxic effects.

Products:
- Allergy Research: Biotin 5000, 5 mg (5,000 mcg) biotin, 60 capsules.
- Country Life: Biotin, 5 mg (5,000 mcg) biotin, 60 capsules.
- Ecological Formulas: MegaBiotin 7500, contains 7.5 mg (7,500 mcg) biotin, 50 capsules.
Black Cohosh

Description: Black cohosh (Cimicifuga racemosa) is native to North America, and has been widely used by Native Americans, early settlers, and herbal doctors. Black cohosh was a main ingredient in Lydia Pinkham’s “Vegetable Compound.” Supplements of black cohosh consist of the fresh or dried rhizome with the attached roots.

Uses: Black cohosh influences the hormonal regulatory systems, greatly alleviating the symptoms of menopause. A considerable number of clinical studies have been published on a product Remifemin, in Germany, supporting the usefulness of black cohosh for premenstrual and menopausal conditions. Black cohosh may be the best documented herbal preparation for these types of problems.

Dosage: Follow instructions on bottle.

Products:
- Nature’s Herbs: Black Cohosh Extract, 80 mg black cohosh root ext (2.5% terpene glycosides), and 380 mg black cohosh root powder, 60 capsules.
- Nature’s Answer. Black Cohosh, 1,000 mg black cohosh root in 28 drops, 1 oz liquid.
- Smithkline Beecham: Remifemin Menopause, 20 mg black cohosh root and rhizome from black cohosh root and rhizome extract, 60 tablets.

Black Currant Seed Oil

Description: Black currant seed oil is derived from the seed of the plant Ribes nigrum. It is a rich source of gamma-linolenic acid (GLA), 15 to 20 percent, as well as alpha-linolenic acid (ALA), 12 to 14 percent, and stearidonic acid (SDA), 2 to 4 percent.

Other oils rich in GLA are borage oil and evening primrose oil, but black currant oil is unique in the fact that it contains ALA along with the GLA. Alpha-linolenic acid is present in high amounts in flaxseed oil.

Uses: GLA is an omega-6 oil. Not all omega-6 oils are undesirable. The predominant omega-6 oils in the diet—linoleic, linolenic, and arachidonic—can be both detrimental and beneficial. Linoleic acid is essential to life. In the body, these oils are converted into powerful, hormone-like substances called prostaglandins. The omega-6 oils can form two types. One type, the 2 series, is usually detrimental, causing inflammation, etc. The other type, the 1 series, is beneficial, reducing inflammation. The GLA type of omega-6 oil leads to the beneficial, series 1 type of prostaglandins. The beneficial actions of series 1 prostaglandins are similar to those of the series 3 prostaglandins derived from omega-3 oils, ALA (flaxseed oil), and EPA (fish oil). Thus, GLA, from borage, black currant, and evening primrose oil, provides much the same benefit as the omega-3 oils from fish and flaxseed.

Some nutritionists prefer recommending the omega-3 oils, and others recommend the GLA-containing oils. But black currant seed oil may offer the best of both, as it contains GLA, which is metabolized to series 1 prostaglandins, and ALA, which is metabolized to EPA, the precursor to series 3 prostaglandins. Stearidonic acid is also metabolized to EPA.

Indications: Menopause, menstrual irregularities, premenstrual syndrome, osteoporosis.

Dosage: The dose can vary widely, with an average ranging from three to six capsules daily.

Cautions: This item has a slight “thinning” effect on the blood. This, generally, is a good thing. But if you are taking “blood-thinning” medications, check with your doctor.

Products:
- Health from the Sun: Black Currant Oil, 1000 mg, 60 softgels.
- Natrol: Black Currant Oil, 500 mg, 90 softgels.
Blue Green Algae

Related Items: Spirulina, green foods, wheat grass, barley grass, chlorophyll, chlorella.
Description: All green-food supplements are relatively rich in protein, chlorophyll, and carotenoids. Marketing claims to the contrary, there is little documented therapeutic difference among them.
Uses: Green-food concentrates of this type are claimed to have anti-cancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents.
While convincing proof of all of these actions may be lacking, there is certainly no reason not to include one of the green-food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antioxidants, and varying amounts of trace nutrients. The problem with these supplements is that exaggerated marketing claims often accompany the products, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.
Indications: Cardiovascular disease, arthritis (rheumatoid), cancer, ulcerative colitis, diabetic neuropathy, skin disorders, eczema.
Cautions: Green-food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.
Products:
Klamath: Blue Green Algae, 500 mg blue green algae, with 2% plant enzymes, 130 vegicaps.

Bone Meal

Related Item: Calcium.
Description: Bone meal is used in supplements as a source of calcium. It is made from the ground bones of cattle.
Uses: Bone meal can contain over 20 percent calcium. Theoretically, it might seem that ground bones would represent an ideal source of nutrition for the bone. Unfortunately, it may contain undesirable substances as well, such as lead. It is also an animal product, which some people find undesirable. With the plethora of other sources of calcium that are available, there seems little reason to use bone meal.
Products:
Solgar: Bone Meal Powder, 1,000 mg calcium, 600 mg phosphorus, 25 mcg vitamin B12, and 20 mg bone marrow per teaspoon, 12 oz powder.

Borage Oil

Related Items: Black currant oil, evening primrose oil.
Description: Borage oil is derived from the seeds of the borage plant, Borago officinalis. The oil contains the highest concentration of gamma-linolenic acid (GLA). GLA is a precursor to the inflammation-suppressing series 1 prostaglandins.
Uses: The therapeutic value of borage oil supplements results from its high concentration of GLA, an omega-6 oil. Not all omega-6 oils are undesirable. The predominant omega-6 oils in the diet—linoleic, linolenic, and arachidonic—can be both detrimental and beneficial. Linoleic acid is essential to life. In the body, these oils are converted into powerful, hormone-like substances called prostaglandins. The omega-6 oils can form two types. One type, the 2 series, is usually detrimental, causing inflammation, etc. The other type, the 1 series, is beneficial, reducing inflammation. The GLA type of omega-6 oil leads to the beneficial, series 1 type of prostaglandin. The beneficial actions of series 1 prostaglandins are similar to those of the series 3 prostaglandins derived from omega-3 oils, ALA (flaxseed oil) and EPA (fish oil). Thus, GLA, from borage, black currant, and evening primrose oil, provides much the same benefit as the omega-3 oils from fish and flaxseed.
Borage oil has been shown to be effective in treating rheumatoid arthritis, Sjogren’s syndrome, and ulcerative colitis. It is also thought to have possible benefit in treating osteoporosis, diabetic neuropathy, hypertension, and elevated triglycerides.

**Indications:** Arthritis (rheumatoid), skin disorders, eczema.

**Dosage:** The usual dose is 360 to 480 milligrams of GLA daily, but the amount can vary over a wide range.

**Cautions:** The presence of pyrrolizidine alkaloids in certain parts of the borage plant has caused some to worry about using borage oil. Pyrrolizidine alkaloids (also found in comfrey, for example) can be hepatotoxic and carcinogenic. So far, these substances have not been found in the oil, and would not be expected to be. Those using high doses of borage oil, over a long period of time, however, should exert caution.

This item has a slight “thinning” effect on the blood. This, generally, is a good thing. But if you are taking “blood-thinning” medications, check with your doctor.

**Products:**
- Solgar: Super GLA 300, 300 mg GLA from 1300 mg cold-pressed borage oil, 60 softgels.
- Health from the Sun: Borage Liquid Gold, 280 mg GLA from borage oil, 4 oz liquid.

### Boron

**Description:** Boron is a trace mineral. It has been known to be essential for plants, but its essentiality to humans has only been recently determined.

**Uses:** Boron seems to be important in helping to maintain healthy bone and joints. Although the actual mechanism is still under investigation, studies have shown that boron, perhaps through involvement with calcium and vitamin D, enhances bone formation. This leads to the recommendation that it may be one of the nutrients important in preventing osteoporosis.

Boron has also been shown to be helpful in treating arthritis, both rheumatoid and osteoarthritis. Other claims for boron, including its purported ability to increase muscle, mental function, etc., have yet to be substantiated.

**Indications:** osteoporosis, arthritis.

**Dosage:** The actual quantity of boron required by humans is not yet determined, but the safe level of intake seems high. For osteoporosis prevention, 1 to 3 milligrams are usually used. For those with osteoporosis, at risk for osteoporosis, or suffering from arthritis, the usual dose is 3 to 9 milligrams daily.

Boron is available in supplements is several different forms, often in combination, but the form may not be too important. Regardless of the form, it seems to be readily converted to boric acid, and distributed throughout the body in that form.

**Cautions:** Some have voiced a concern that boron may raise estrogen levels. Boron may enhance or mimic the action of estrogen on calcium metabolism in postmenopausal women. This is good. Osteoporosis is bad, and a boron deficiency may be a significant factor leading to the high incidence of osteoporosis and other menopausal symptoms.

**Products:** A good osteoporosis formula, containing boron in addition to all of the other nutrients directly involved in bone health, is Twinlab’s Tri-Boron Plus. It provides, in four capsules, a full supply of boron, calcium, magnesium, vitamin D, zinc, manganese, copper, and betaine hydrochloride to enhance absorption.

Vitaline: Boron, 6 mg, 6 mg boron from boron citrate and boron aspartate, 90 tablets. One-half tablet can be used, if desired.

Twinlab: Tri Boron, 3 mg boron from boron citrate, glycinate, and aspartate, 100 capsules.
**Boswellia**

Description: The resin from a tree found in India, boswellia (Boswellia serrata) is an important Ayurvedic remedy. It is closely related to frankincense.

Uses: Modern interest in boswellia is related to its ability to reduce inflammation and pain. The active ingredient seems to be the boswellic acids. It has been shown in many studies to be an effective treatment of both rheumatoid and osteoarthritis, possibly with significant advantages over nonsteroidal anti-inflammatory drugs. It reduces pain and joint stiffness. There is some evidence that boswellia may be helpful in treating leukemia, but this is very preliminary.

It is thought that boswellic acid blocks leukotriene synthesis. Leukotrienes are the prostaglandins responsible for inflammation and pain.

Indications: arthritis, irritable bowel syndrome, Crohn’s disease, ulcerative colitis, sports injuries, asthma.

Dosage: The dose varies, depending on the standardization of the product. For a product standardized to 60 to 65 percent boswellic acid, such as those listed below, the usual dose is three tablets or capsules daily. This will provide a total of approximately 600 milligrams of boswellic acid.

For products standardized to a lower potency, higher doses may be required.

- Nature’s Herbs: Boswellin, 60% X 250 mg = 150 mg per tab, 50 tablets.
- Nature’s Way: Boswellia Extract, Standardized, 65% boswellic acids 65% X 307 mg = 200 mg per tab, 60 tablets.
- Solgar: Boswellia Resin Extract, 65% X 350 mg = 228 mg per cap, 60 vegicaps.

**Bovine Cartilage**

Related Items: Bovine cartilage, shark cartilage, glucosamine, chondroitin, green-lipped mussel extract, sea cucumber.

Description: Cartilage is the gristle or connective tissue attached to the ends of bones. It is a component of joints, and helps cushion and support the bones.

In general terms, cartilage is composed of collagen and proteoglycans, which in turn contain glycosaminoglycans (GAGs) or mucopolysaccharides, which in turn contain chondroitin sulfate, which in turn contains glucosamine. There is considerable argument and debate in the nutritional supplement industry over which of the forms of cartilage—shark cartilage, bovine cartilage, glucosamine sulfate, chondroitin sulfate, or other mucopolysaccharide-rich substances such as green-lipped mussel extract or sea cucumber—are most effective. There is no clear answer, as there is some degree of support for each argument, and there is clinical evidence supporting the efficacy for each supplement.

Uses: The primary use for this supplement is to rebuild damaged connective tissue and joints, reduce inflammation, and relieve the pain associated with osteoarthritis and sports injuries. Cartilage supplements, however, have historically been used for a different purpose—as a treatment for certain forms of cancer. The basis for the use of cartilage in treating cancer is that it was thought to inhibit the formation of new blood vessels (angiogenesis). In spite of early enthusiasm in this area, followup research has not been forthcoming.

It is difficult to assign a specific use for shark or bovine cartilage supplements today. Rich in the minerals and protein building blocks of bone and connective tissue, they certainly could be part of any supplement regimen involving arthritis or osteoporosis. But as a primary treatment for a condition such as arthritis, glucosamine sulfate and/or chondroitin sulfate should perhaps be given precedence. For cancer, the advice of a qualified health professional should be sought out, to determine whether or not cartilage treatment is appropriate.

Indications: Cancer, arthritis

Dosage: For cancer, extremely large doses were utilized. For arthritis and in support of other supplements,
up to 2 grams a day is sufficient.

Products:
Vita Carte: Bovine Cartilage, bovine tracheal cartilage, 750 mg.

**Broccoli Extract**

Related Items: Cruciferous vegetables, indole-3-carbinol.
Description: Broccoli is a member of the cabbage family. It contains substances such as indole-3-carbinol, sulforaphane, and diindolylmethane that have been reported to have anticancer activity. It is also a good food source of carotenoids, flavonoids, vitamin K, and vitamin C. Indole-3-carbinol and sulforaphane are sulfur-containing compounds that may prevent certain cancers by stimulating some of the natural detoxification systems of the body.

Broccoli extracts rich in these substances may be especially helpful in preventing breast and cervical cancer due to its effect on estrogen metabolism.

More research is needed to determine just how effective this material may be.

Indications: Cancer
Uses: While additional corroborative research is desirable, a person who is considered at risk for breast cancer would seemingly be well advised to utilize a product of this type as part of her supplement regimen.

Products:
Solgar: Broccoli Cruciferous Extract, 500 mg, 2% (10 mg) glucosinolates, 50 vegicaps.
Nature’s Herbs: Broccoli Power, 250 mg cruciferous blend providing 2% glucosinolates, including sulforaphane, 60 capsules.

**Bromelain**

Description: Bromelain is the protein-digesting enzyme (cysteine protease, or proteolytic enzyme) found in pineapple. It has a long history of medicinal as well as food use. It is a principal active ingredient in meat tenderizer, for example.

Uses: Its primary uses as a dietary supplement fall into two categories. First, because of its protein-digesting qualities, it is often included in digestive enzyme formulas, to assist in the breakdown of food proteins. Second, it seems to exert an anti-inflammatory action, making it valuable in treating sports injuries, sprains, strains, tendinitis, sinusitis, prostatitis, and possibly rheumatoid arthritis.

There is some question as to whether or not it needs to be absorbed from the intestine to exert some of these actions, and the exact mechanisms are unknown. For this reason, some bromelain-containing products that are designed to exploit its anti-inflammatory actions are enteric-coated, and the product is to be taken between meals. Obviously, when taken as a digestive aid, it should be taken with meals.

Indications: Indigestion, sports injuries, arthritis, diarrhea, asthma, wound healing, sinusitis, digestive aid.

Dosage: The most important thing about bromelain dosage is to be sure it is labeled in units of potency. Milligrams, alone, is not sufficient. Bromelain is available in up to twelve different potencies as a raw material, and a product that is labeled only in milligrams is totally meaningless, and should not be purchased. The two most common units of potency that should appear on a label are GDU (gelatin-digesting units) or MCU (milk-clotting units). One GDU is equal to about 1.5 MCU. The usual dose can vary from 500 to 2,000 GDU, one to three times daily. If taken as a digestive aid, take the product with meals. If taken for its anti-inflammatory and healing activity, take it between meals.

Caution: There are some products on the market that contain bromelain (and papain, another protein-digesting enzyme) in “chewable” wafers. If you have ever experienced the sore mouth and tongue that sometimes results from eating raw pineapple, you should wonder how you could chew a wafer that contained any appreciable amount
of bromelain or papain without experiencing the same phenomena. Thus, it is likely that a chewable product would be of fairly low potency.

Cautions: Bromelain may have a slight blood-thinning action, so caution should be exerted if you are taking anticoagulant medication.

Products:
- Solgar: Bromelain, 500 mg, 1,000 GDU bromelain per tablet, vegetarian, 60 tablets.
- Twinlab: Mega Bromelain, 600 GDU bromelain per capsule, 90 capsules.
- Country Life: Bromelain, 500 mg (2,000 GDU), 1,000 GDU bromelain per tablet, vegetarian and kosher, 60 tablets. Here is a product that could be labeled in a less-confusing way. See Chapter 4, “Just the Facts, Please,” for more information.

Buffered Vitamin C

Related Items: Vitamin C, effervescent C.

Description: Buffered vitamin C refers to a product that consists of a mineral ascorbate of vitamin C designed to reduce the acidity associated with regular ascorbic acid.

Uses: Some people find that regular vitamin C, ascorbic acid, is too acid. By converting all or some of the vitamin C to mineral ascorbates, the acidity is reduced, and the supplement may be more tolerable, especially in high doses. The minerals commonly used are calcium, magnesium, potassium, and zinc. Sodium also works but is rarely used because some individuals are on low-sodium diets. When all of the vitamin C in the product is converted to mineral ascorbate, the resulting pH is close to neutral.

Some “buffered C” products contain mixtures of mineral bicarbonates and vitamin C, and when mixed with water, the bicarbonate reacts with the vitamin C, releasing carbon dioxide (the “fizz”) and forming mineral ascorbates (calcium ascorbate) which is less acid than free vitamin C. Some products add a little extra citric acid, etc., to enhance the “fizz factor.” Some are flavored, and some are not.

Other “buffered C” products consist of “fully reacted” mineral ascorbates (calcium ascorbate), rather than a mixture of free vitamin C and mineral carbonate/bicarbonate (vitamin C and calcium carbonate). These products would not be expected to “fizz” when stirred into water. But there is also no question as to how completely the acidic vitamin C has been neutralized.

If you are taking a buffered vitamin C powder because you find an effervescent liquid more palatable, then the bicarbonate form is what you want. If you are taking buffered vitamin C powder because you are very sensitive to the acidic nature of vitamin C, then those products containing the fully reacted ascorbates might be the better choice.

Remember, however, as we explained in Chapter 4, if it fizzes, it is not “fully reacted” no matter what the ingredient statement on the label might imply.

Products:
- Allergy Research: Buffered Vitamin C Powder, 900 mg vitamin C as calcium, magnesium, and potassium ascorbates per 1/2 teaspoon, 240 g. This product contains vitamin C and mineral carbonates, which react when added to water. It is hypoallergenic, and produces a moderate “fizz.” This same formulation is also available in capsule form.
- Alacer: Emergen-C, 1,000 mg vitamin C as mineral ascorbates, and all the B vitamins, per packet, 36 packets. This product is a mixture of bicarbonates, vitamin C, citric acid, etc., resulting in a pronounced fizz. It comes in numerous flavors, etc.
- Twinlab: Super Ascorbate C Powder, 2,000 mg vitamin C, from calcium, magnesium, zinc, and manganese ascorbates, with bioflavonoids, rose hip, acerola, etc., 8 oz. This product is an example of one that contains “fully reacted” mineral ascorbates. It does not fizz.
- Alacer: Super Gram II, 1,000 mg timed-release vitamin C as 7 fully reacted mineral ascorbates, 260 tablets.
**Butcher’s Broom**

Description: Butcher’s broom (Ruscus aculeatus) is an evergreen shrub native to Mediterranean Europe and parts of Africa. The dried rhizome and root are used medicinally, and contain the steroid saponins ruscin and ruscoside.

Uses: Historically, butcher’s broom was used as a laxative and diuretic agent. Now, especially in Europe, it is used for problems involving the circulatory system, including venous fragility, varicose veins, and hemorrhoids. The German Commission E has approved butcher’s broom for the treatment of “chronic venus insufficiency.”

What is this? It is a term used to describe what happens when veins become chronically swollen and inflamed. It results in an aching, tired feeling in the legs. There may be pain, itching, leg ulcers, and changes in skin pigmentation. It is commonly associated with varicose veins. The standard treatment for chronic venous insufficiency is compression using bandages or support stockings, drugs, or surgery.

Indications: Varicose veins, hemorrhoids, leg cramps, chronic venous insufficiency.

Dosage: Generally, use an amount of extract equivalent to about 10 mg total ruscogenin.

Products:
- Solgar: Butcher’s Broom, 50 mg butcher’s broom root extract (5:1), 283 mg butcher’s broom root powder, 100 vegicaps.
- Nature’s Herbs: Butcher’s Broom Root, 470 mg, 100 capsules.

**Calcium**

Related Items: Calcium carbonate, oyster shell calcium, calcium citrate, bone meal, dolomite, MCHC, calcium lactate, calcium gluconate, calcium phosphate, chelated calcium.

Description: Calcium is an essential mineral. Its best-known role is as a major constituent of bones and teeth, but calcium plays numerous other important roles in the body, including muscle contraction, nerve transmission, blood coagulation, heart contractions, energy, and immune function. Calcium makes up 1 to 2 percent of total body weight, and about 99 percent of the body’s calcium is found in the bone and teeth.

Uses: Calcium is necessary for proper bone growth. Up to age 35, calcium along with other minerals is needed to build up maximum bone density. After that age, bone density starts to decline and calcium is needed to retard that decline. More than half of the young people today fail to get the required amount of calcium. Most women only get 60 percent of the recommended level of calcium, and 95 percent of women get less than 800 milligrams daily. Twenty-five percent of men fail to get enough calcium. When calcium intake is too low, and bone density decreases, osteoporosis results.

In addition to preventing and treating osteoporosis, calcium may also reduce the risk of colon cancer and may help lower blood pressure in those with hypertension.

In recognition of the importance of adequate calcium supplementation, the recommended intake levels have recently been increased. The “adequate intake” for teenagers is now 1,300 milligrams per day. The adequate intake for men and women below 50 years of age is 1,000 milligrams per day, and 1,200 milligrams per day for those over 50.

It is almost impossible to achieve adequate calcium intake without taking a calcium supplement. Unfortunately, choosing the proper calcium supplement can be difficult.

Because the daily requirement is so high (1,000 to 1,200 milligrams or more), it is difficult to obtain the necessary amount in only one or two tablets. It is impossible to obtain it in a “one-a-day” multivitamin supplement.

Calcium comes in many different forms, and each form provides different amounts of calcium. This means that depending on the form, you may need anywhere from two to twelve tablets to get the same 1,000 milligrams of calcium. Why is that?
Calcium is always present in combination with another component. It never occurs by itself. Here is a list of some of the commonly used calcium compounds in nutritional supplements:

- Calcium carbonate, 40 percent calcium
- Calcium phosphate tribasic, 35 percent calcium
- Microcrystalline hydroxyapatite, 25 percent calcium
- Calcium phosphate dibasic, 23 percent calcium
- Calcium citrate, 21 percent calcium
- Calcium lactate, 13 percent calcium
- Calcium gluconate, 9 percent calcium

What this means is that it is necessary to use 2,500 milligrams of calcium carbonate to get 1,000 milligrams of “elemental” calcium. Likewise, it is necessary to use 4,750 milligrams of calcium citrate, and 11,100 milligrams of calcium gluconate to get the same 1,000 milligrams of elemental calcium. You can understand, then, why you may need to take only two tablets of calcium from calcium carbonate, but you may need four tablets of calcium from calcium citrate to get that same 1,000 milligrams of elemental calcium. It gets worse, as you would need 18 tablets of calcium from calcium gluconate to get 1,000 milligrams.

Let’s look at it another way. Here is a selection of calcium products from one manufacturer, Solgar, and the number of tablets needed to obtain at least 1,000 milligrams of elemental calcium:

- Calcium 600-2 tablets (1,200 milligrams calcium)
- Calcium citrate-4 tablets (1,000 milligrams calcium)
- Calcium gluconate-18 tablets (1,080 milligrams calcium)
- Calcium lactate-12 tablets (1,013 milligrams calcium)
- Chelated calcium-6 tablets (1,000 milligrams calcium)

So now you are probably wondering, “Why would anyone take eighteen tablets to get 1,000 milligrams of calcium when they could take two?”

Unfortunately, there is a reason. And that reason is related to the fact that these different forms of calcium are not absorbed equally well. The calcium carbonate form, for example, may work fine if you have plenty of hydrochloric acid in your stomach and/or always take it with food, while the calcium citrate form is well absorbed regardless of the level of gastric acid that might be present. People tolerate certain forms better than others. For more information on the pros and cons of each form, look up the individual listings.

There are other considerations as well. For optimal efficacy, magnesium should be taken along with calcium, either separately, or as a combination in the same product. This further increases the tablet size. And for many people with concerns about osteoporosis, additional vitamin D may be appropriate as well, and some calcium supplements include vitamin D along with the calcium.

In general, for optimal absorption, calcium supplements should be taken two or three times a day, with meals. If blood levels of calcium fall below a certain point, the body compensates by pulling calcium out of the bone. To the body, maintaining the required calcium level in the blood is more important than maintaining bone density, so it treats bone as a backup calcium storage depot. This is why you should supplement with calcium throughout the day, rather than at night.

It is important to emphasize, relative to osteoporosis and bone growth, that calcium will not do the job alone. The other minerals, magnesium and trace minerals, are necessary as well. It is a mistake for doctors to recommend calcium supplements without also recommending the other minerals as well.

Indications: Osteoporosis, cancer (colon), hypertension.
Cautions: Depending on the type of kidney stone, calcium, when taken with meals, may actually prevent kidney
stone formation. Talk to your doctor.

There are certain conditions that result in hypercalcemia (hyper-parathyroidism, hypervitaminosis D, sarcoidosis, cancer). Do not take supplemental calcium if you already have too much.

Certain drugs interact with calcium supplementation; check with your pharmacist. Certain nutritional supplements may do so as well. Inositol hexaphosphate (phytic acid) may bind calcium and block its absorption, while supplementation with FOS may increase its absorption.

Products: See individual forms of calcium for product recommendations.

**Calcium Carbonate**

Related Item: Calcium.

Description: Calcium carbonate is used in supplements as a source of calcium. It can be derived from several sources, including oyster shell and limestone. See Calcium for more information.

Uses: Calcium carbonate provides the highest concentration of calcium for use in nutritional supplements. It contains 40 percent calcium, and to obtain 1,000 milligrams of elemental calcium, you would need about 2,500 milligrams of calcium carbonate. This means you can get a full day’s calcium requirement in only two tablets.

There is a downside, however. Calcium carbonate is “inorganic” calcium. For optimal absorption by the body, it needs to be ionized. Normally, gastric acid will achieve this. But if stomach acid levels are low, it may not be well absorbed. Low stomach acid is not uncommon in older people. Other forms of calcium, the organic chelated forms such as the citrate, lactate, and glycinate, are not as dependent on gastric acid for absorption.

If fewer number of tablets is more important than optimal absorption, take calcium carbonate supplements, but be sure to take them in divided doses—for example, one tablet with breakfast and one tablet with dinner—and be sure to take it with meals. On the other hand, if you are at high risk of osteoporosis and may not have optimal gastric function, you should consider getting at least part of your calcium supplementation from more easily absorbed forms.

Calcium carbonate from natural sources, such as oyster shell, contain small amounts of lead. This is of little concern as long as the amounts are below accepted standards. Avoid buying a cheap oyster shell calcium supplement. It is a relatively inexpensive product, and you should buy only well-known, reputable brands.

Cautions: For optimal bone health, all of the minerals are needed. Magnesium is required, usually at levels equal to half of what is recommended for calcium. Taking a calcium supplement alone may not be helping you as much as you think. It is not difficult to get the micro-minerals (zinc, copper, etc.) in your daily multivitamin, but to get the proper amount of magnesium, you will need to take it separately, or in combination with calcium. Vitamin D is also required for optimal absorption of calcium.

Products:
- Twinlab: Cal 1000 with Vit D, 1,000 mg calcium from carbonate and citrate, 400 IU vitamin D, 120 tablets.
- Solgar: Cal 600, 600 mg calcium from carbonate (oyster shell), 300 IU vitamin D, 120 tablets.
- NOW Foods: Calcium Crave Chewy Chocolate, 500 mg calcium (400 mg as carbonate, 100 mg as citrate), 100 IU vitamin D per chew, 60 chews. This is an excellent alternative to tablets and capsules, containing a mixture of carbonate and citrate, in a tasty chewy “candy.”

**Calcium Citrate**

Related Item: Calcium.

Description: Calcium citrate is used in supplements as a source of calcium.

Uses: Calcium citrate is an excellent source of calcium because it is well absorbed, and contains about 21 percent elemental calcium. It is more expensive than calcium carbonate, and you will need four tablets rather than two to get 1,000 milligrams of elemental calcium. But it is well tolerated and well absorbed even if stomach acid levels
are low.
If your need for calcium supplementation is critical, it is best to use a supplement such as calcium citrate rather than calcium carbonate.
If you are taking acid-blocking drugs, you will need to use calcium citrate, or other chelated forms of calcium, rather than calcium carbonate.
Cautions: For optimal bone health, all of the minerals are needed. Magnesium is required, usually at levels equal to half of what is recommended for calcium. Taking a calcium supplement alone may not be helping you as much as you think. It is not difficult to get the micro-minerals (zinc, copper, etc.) in your daily multivitamin, but to get the proper amount of magnesium, you will need to take it separately, or in combination with calcium. Vitamin D is also required for optimal absorption of calcium.

Products:
Solgar: Cal Citrate with Vit D, 250 mg calcium from citrate, 150 IU vitamin D, kosher and vegetarian, 240 tablets.
NOW Foods: Calcium Citrate Powder, 700 mg calcium in 1 teaspoon (3 g) of calcium citrate, 8 oz.
Allergy Research: Calcium Citrate, 150 mg, 180 capsules.

Calcium Gluconate

Related Item: Calcium.
Description: Calcium gluconate is used in supplements as a source of calcium.
Uses: This form of calcium is well absorbed and well tolerated, but provides only 9 percent elemental calcium. There seems little reason to use this form rather than calcium citrate.
Products:
Solgar: Calcium Gluconate, 650 mg, 60 mg calcium from gluconate, 250 tablets.
Willner Calcium Gluconate, 500 mg, 46 mg calcium from gluconate, 250 capsules. Elemental calcium not stated on the label.

Calcium Lactate

Related Item: Calcium.
Description: Calcium lactate is used in supplements as a source of calcium.
Uses: Calcium lactate contains about 13 percent calcium, and is well absorbed and well tolerated. It provides less calcium per unit weight than calcium citrate, however, and more tablets are required to achieve the same intake of elemental calcium. Contrary to what some believe, calcium lactate does not contain lactose, and is quite suitable for those with lactose intolerance or milk allergies.
Products:
Twinlab: Calcium Lactate, 100 mg calcium from 740 mg calcium lactate, 250 capsules.
Solgar: Calcium Lactate, 650 mg, 250 tablets.

Calcium Pantothenate

See Pantothenic Acid.

Calcium Phosphate

Related Item: Calcium.
Description: There are several forms of calcium phosphate used in nutritional supplements. Dibasic calcium phosphate and tribasic calcium phosphate are two examples.
Uses: These forms of calcium are used in various nutritional formulations, sometimes as fillers. Theoretically, they can serve as a source of calcium. The dibasic form contains about 23 percent calcium and the tribasic form contains about 35 percent calcium. But this is inorganic calcium and, perhaps most important, has a high phosphorous content. This may actually interfere with the bone-building action of calcium. Phosphate forms of calcium are generally not recommended.

Canthaxanthin

Related Items: Carotenoids, beta-carotene.
Description: Canthaxanthin is a carotenoid but, unlike beta-carotene, cannot be converted to vitamin A.
Uses: Some research shows that canthaxanthin might be effective in lowering risk of cancer.

Caprylic Acid

Description: Caprylic acid is a medium-chain (8-carbon) saturated fatty acid. It is found naturally, in the form of triacylglycerols, in palm oil, coconut oil, and butterfat.
Uses: Caprylic acid has been used as a natural antifungal agent, especially for the treatment of chronic candidiasis. It has remained a popular treatment for this condition, but some feel that its effectiveness has not been convincingly demonstrated.
Indications: Candidiasis.
Products:
   Solgar: Caprylic Acid, 365 mg caprylic acid as calcium, magnesium, zinc, and potassium caprylates, 250 tablets.
   TE Neesby: Mycopril 680, 680 mg caprylic acid as calcium magnesium caprylate, 250 capsules.

Carnitine

Related Item: Acetyl-L-carnitine.
Description: L-carnitine, also known as just carnitine, is an amino acid derivative that facilitates the transport of long-chain fatty acids across the cell membrane into the mitochondria, where they are metabolized (oxidized) to produce energy (in the form of ATP, or adenosine triphosphate).
Uses: Carnitine’s primary value lies in its ability to alleviate various problems associated with cardiovascular disease. This includes heart attack, angina, elevated triglyceride levels, congestive heart failure, and intermittent claudication. It has been called a “cardioprotective” agent. It lowers triglyceride levels and increases levels of HDL cholesterol.
There are other possible benefits from carnitine supplementation, but they are not as well documented. These other uses revolve around its role in energy production, and include chronic fatigue syndrome, athletic performance, diabetes, and weight loss.
   Acetyl-L-carnitine is a related compound, but is not utilized for the same purpose. Acetyl-L-carnitine has a neuroprotective action, and is used for age-related cholinergic-deficit problems such as Alzheimer’s disease.
Indications: Cardiovascular disease, diabetes, weight loss, cholesterol problems, energy (low), triglycerides (High), athletic performance.
Dosage: From 500 to 2,000 milligrams daily, in divided doses, with or without food.
Products:
Twinlab: CarniFuel Liquid, 1,000 mg of carnitine per tablespoon, 8 oz.
Phyotherapy: Carnitine Fumarate, 250 mg carnitine from 450 mg carnitine fumarate, 60 capsules. Highly stable and absorbable.
Jarrow: Carnitine, 500 mg, 500 mg carnitine from 750 mg carnitine tartrate, 100 capsules.

**Carnosine**

Description: Carnosine is a compound made up of the two amino acids histidine and alanine. It is found in muscle tissue and the brain. It appears to be a strong water-soluble antioxidant. It might possibly function as a neurotransmitter substance.

Uses: There is speculation that carnosine may play a role in immune function, wound healing, heavy metal chelation, and cancer treatment, but the research supporting these uses is still preliminary. There is evidence that carnosine, as a zinc salt, may be of value in treating peptic ulcers, and may actually kill Helicobacter pylori.

Current interest in carnosine seems centered around its possible anti-aging action. It is thought to retard glycosylation, or biochemical cross-linking between proteins and certain sugars.

Indications: Ulcer (peptic), anti-aging.

Dosage: The suggested dose for treating ulcers is 150 milligrams, twice a day.

Products:
Jarrow: Carnosine 500, 90 capsules, 500 mg L-carnosine (alanyl-histidine) per capsule.

**Carotenoids**

Related Items: Beta-carotene, lycopene, lutein, cryptoxanthin, and xeaxanthin.

Description: Carotenoids, or carotenes, are the red, orange, and yellow plant pigments that protect against oxidative damage during photosynthesis. There are over 600 carotenoids in nature.

Uses: Carotenoids, in general, serve two main functions: as antioxidants and as precursors to vitamin A.

Only a small number of carotenoids can actually be converted to vitamin A in the body (beta-carotene, alpha-carotene). Others, such as lycopene and lutein, function as powerful antioxidants.

It should be noted that there is more evidence that a deficiency of dietary carotenoids, or beta-carotene, is a cause of increased cancer, heart disease, cataracts, and immune system problems than there is evidence that supplemental beta-carotene reduces those disorders. This leads to the conclusion that for maximum value, natural mixed carotenoids, in moderate dosage, is superior to synthetic beta-carotene, in high doses, and that it is important that carotenes be administered along with the other antioxidant nutrients.

Dosage: There is a very wide range of bioavailability among the various individual carotenoids. Bioavailability is also influenced by other foods, such as fiber, which lowers it, and fat, which improves it. Various carotenoids interfere with each other as well, and the amount absorbed decreases as the amount ingested increases.

On labels, carotenoids are usually labeled as an equivalent to vitamin A, but this value has been the subject of much debate and disagreement, even between government agencies. For reference purposes, 15 milligrams of beta-carotene is equivalent to 25,000 IU of vitamin A or 5,000 Retinal Equivalent. The DV (Daily Value) for vitamin A is 5,000 IU (or 1,000 RE).

Supplements generally provide up to the equivalent of 25,000 IU of vitamin A (up to 15 mg of beta-carotene). There is little reason to have more than 4,000 to 5,000 IU of preformed vitamin A in a general multivitamin supplement; the balance should be from natural beta-carotene.

For those of you who think 25,000 IU of vitamin A from beta-carotene is a lot, we should point out that one raw carrot contains over 20,000 IU of vitamin A (from beta-carotene).

Cautions: During pregnancy, it is advisable to avoid more than 8,000 IU of supplemental preformed vitamin A. Because of this, some physicians think the same limit should apply to carotenoids. This is incorrect. Supplemental
carotenoids should be perfectly safe during pregnancy. Orally ingested carotenoids, such as beta-carotene, show no detectable toxicity, even at very large doses.

On the other hand, prudence and caution should rule during pregnancy. Unless there is a compelling reason to take exceptionally high doses of carotene during pregnancy, it would seem best not to do so. The levels usually present in balanced multivitamin supplements should not be of concern. Too much caution can be a problem as well. Studies have shown that plasma carotene levels during pregnancy, in mothers who smoke, was directly related to birthweight.

The only condition associated with high doses of beta-carotene is a yellowing of the skin. When the dose is reduced, the discoloration disappears.

Products:
- Twinlab: MaxiLife Multi Carotene, 20,000 IU vitamin A as beta-carotene, 6 mg lutein, 5 mg lycopene, and 4 mg carrot oil (9.5% carotenoids), 60 capsules.
- Solgar: Advanced Carotenoid Complex, 25,000 IU vitamin A as beta-carotene, plus alpha-carotene, gamma-carotene, lutein, lycopene, and capsanthin, 60 softgels.
- Nature’s Way: Multi Carotene, 40,000 IU vitamin A as beta-carotene and alpha-carotene, plus gamma-carotene and lycopene, 60 softgels.

**Cartilage**

Related Items: Bovine cartilage, shark cartilage, glucosamine, chondroitin, green-lipped mussel, sea cucumber.

Description: Cartilage is the gristle or connective tissue attached to the ends of bones. It is a component of joints, and helps cushion and support the bones.

In general terms, cartilage is composed of collagen and proteoglycans, which, in turn, contain glycosaminoglycans (GAGs) or mucopolysaccharides, which, in turn, contain chondroitin sulfate, which, in turn, contains glucosamine. There is considerable argument and debate in the nutritional supplement industry over which of the above—shark cartilage, bovine cartilage, glucosamine sulfate, chondroitin sulfate, or other mucopolysaccharide-rich substances, such as green-lipped mussel and sea cucumber—are most effective. There is no clear answer, as there is some degree of support for each argument, and there is clinical evidence supporting the efficacy for each supplement.

One persuasive argument for the use of glucosamine sulfate is that it is the smallest entity of the group and, thus, may be the form most readily absorbed. The same argument may hold for the use of chondroitin sulfate over the various cartilage extracts.

There is also some evidence that the sulfate component is important as well, and that the sulfate forms are more effective than other forms.

Uses: The primary use for these supplements, in general, is to rebuild damaged connective tissue and joints, reduce inflammation, and relieve the pain associated with osteoarthritis, sports injuries, etc.

Cartilage supplements, however, have historically been used for a different purpose—as a treatment for certain forms of cancer. In spite of early enthusiasm in this area, follow-up research in support of this use has not been forthcoming. The basis for the use of cartilage in treating cancer was that it was thought to inhibit the formation of new blood vessels (angiogenesis).

It is difficult to assign a specific use for shark and bovine cartilage supplements today. Rich in the minerals and protein building blocks of bone and connective tissue, they certainly could be part of any supplement regimen involving arthritis and osteoporosis. But as a primary treatment for a condition such as arthritis, one would have to wonder if glucosamine sulfate and/or chondroitin sulfate should take precedence. For cancer, likewise, the advice of a qualified health professional should be sought out, to determine whether or not cartilage or other treatments are most appropriate.

Indications: Arthritis, cancer.
Dosage: For cancer, extremely large doses were utilized. For arthritis, in support of other supplements, up to 2 grams a day are sufficient.

Products:
- Seagate: Shark Cartilage, 650 mg, 100 capsules.
- Lane Labs: Benefin Caplets, 750 mg shark cartilage per caplet, 270 caplets.

**Cat’s Claw**

Description: The type of cat’s claw used commercially is either Uncaria tomentosa (popular in the United States) or Uncaria guianensis (popular in Europe). It is common in the Amazonian rain forest, and the source of most commercial herb is either Peru or Brazil. The Spanish common name is una de gato.

Uses: Interest in cat’s claw skyrocketed a few years ago. Rumors about its use as a South American folk remedy against cancer provided fodder for entrepreneurs, who began touting its value as a treatment not only for cancer, but also for HIV, arthritis, and intestinal disorders.

Unfortunately, almost all of the evidence for this was anecdotal. Cat’s claw may turn out to enhance immune system, help prevent or treat cancer, and reduce the pain and inflammation associated with arthritis. But firm evidence is still lacking.

Indications: Arthritis, cancer, HIV, immune system Crohn’s disease, irritable bowel syndrome.

Products:
- Jarrow: Cat’s Claw 6:1, 500 mg of a 6:1 extract of the inner bark, 100 capsules.
- Nature’s Herbs: Cat’s Claw, 500 mg cat’s claw bark, 250 capsules.
- Nature’s Answer: Cat’s Claw Alcohol Free, 14 drops contain 500 mg of a 4:1 extract of cat’s claw inner bark, 2 oz liquid.

**CDP-Choline**

Related Items: Choline, phosphatidylcholine, lecithin.

Description: Cytidine 5’diphosphocholine (CDP-choline) is a naturally occurring substance that is a precursor to the biosynthesis of phosphatidylcholine.

Uses: CDP-choline is thought to be especially useful for mental function and cell-membrane integrity. As an essential intermediate for the synthesis of phosphatidylcholine, some feel that CDP choline is more active in brain biochemistry.

Indications: Cardiovascular disease, mental function, Alzheimer’s disease, tardive dyskinesia, Parkinson’s disease, brain injury, stroke.

Dosage: 500 to 2,000 milligrams daily. CDP-choline contains about 21% choline.

Products:
- Jarrow: CDP Choline, 250 mg, 60 capsules.

**Cetyl Myristoleate**

Description: Cetyl myristoleate (CMO) is a waxy, lipid substance, an ester, that is composed of cetyl alcohol and myristoleic acid.

Uses: Cetyl myristoleate is thought to be of value in alleviating the discomfort of arthritis, both osteo and rheumatoid. This is based upon a small number of animal studies, patent filings, and one human study that was published in a non-peer-review journal—all by the same researcher.

This lack of convincing evidence of its effectiveness does not mean, of course, that cetyl myristoleate will not
be shown to function as a joint “lubricant” and anti-inflammatory agent, as has been claimed. But until then, other anti-inflammatory supplements should be tried before turning to cetyl myristoleate. If other substances have been used, with only partial success, cetyl myristoleate is certainly worth trying.

Indications: Arthritis, fibromyalgia.
Dosage: 400 to 500 milligrams daily, for at least 30 days.
Products:
Natrol: CetylPure, 550 mg cetyl myristoleate, 120 capsules.

**Chaste Tree Berry**

Description: Chaste tree (Vitex agnus castus) is originally native to the Mediterranean area. The ripe, dried fruits are the source of medicinal components.

Uses: Chaste tree fruit has been used for at least two thousand years. It is now officially approved by Commission E for irregularities of the menstrual cycle, premenstrual complaints, and mastodynia (breast tenderness). Chaste tree fruit itself does not contain hormones, but it has an effect on the pituitary gland, and seems to cause an increase in the release of progesterone during the second phase of the menstrual cycle. It may also lower prolactin levels.

It is used for many female problems, including PMS, heavy or frequent menstrual cycles, infertility, menopausal symptoms, uterine fibroids, and it is used to increase the flow of breast milk.

Indications: Premenstrual syndrome, fibrocystic breast disease, infertility, menopause, menstrual irregularities.
Dosage: Tinctures, follow instructions on bottle. Capsules, one capsule, up to three times a day.
Products:
Nature’s Answer: Vitex Chaste Berry Drops, 2,000 mg vitex berry fluid extract in 56 drops (2 ml), 1 oz liquid.
Nature’s Answer: Vitex Agnus Castus, 40 mg chaste tree berry, 90 capsules.

THE PHARMACIST SAYS: What is the Commission E? In Germany, herbal products are widely used, and the government has taken measures to guarantee that the public is assured of their safety and efficacy. In 1978, the Bundesgesundheitsamt (Federal Health Agency) established an expert committee on herbal remedies charged with evaluating the safety and efficacy of phytomedicines. This organization of experts is called the Commission E. When the Commission evaluates an herbal remedy, it publishes its findings in monograph form. Some of the findings are positive, and others are negative. These collected monographs have been translated into English by the American Botanical Council and published as, The Complete German Commission E Monographs: Therapeutic Guide to Herbal Medicines, edited by Mark Blumenthal (American Botanical Council, Integrative Medicine Communications, 1998). A more informative, expanded version was later published by the same organization under the name Herbal Medicine: Expanded Commission E Monographs (2000).

**Chelated Calcium**

Related Item: Calcium.
Description: Chelated calcium is a form of calcium supplement utilizing calcium that is bound to another substance, usually an amino acid.

Uses: Properly defined, a chelate would indicate a certain type of cyclic compound formed between an organic molecule and a metallic ion. In this case, calcium is the metallic ion, and the organic compounds used are generally amino acids. Perhaps the best-known “chelating agent” is EDTA. A good example of a chelated calcium compound would be one in which the calcium is bound by, or chelated to, the amino acid glycine. The compound calcium
bisglycinate, for example, is a true calcium chelate. Other forms of chelated calcium are identified as amino acid chelates, or protein chelates.

Not all products labeled as “chelated minerals” are true chelates, however. In the past, unscrupulous manufacturers would merely dump some inorganic mineral into a slurry of soy protein, stir it up, spread it onto trays, and dry it. Voila. Instant “chelated mineral”! Obviously, this does not yield a true mineral chelate.

Another use of the term chelated mineral is a looser definition, referring to what more correctly would be organic calcium compounds rather than inorganic compounds. Examples would be calcium gluconate, lactate, and citrate. While the nature of the chemical bond in these compounds may not fit the true definition of a chelate, the end result is pretty much the same—enhanced absorption and tolerance, and less dependence on the ionizing action of gastric acid. Unfortunately, chelates contain relatively low amounts of calcium, necessitating a greater number of large tablets.

Products:
Solgar: Chelated Calcium, 1,000 mg calcium from calcium glycinate in 6 tablets, 250 tablets.

Chelated Magnesium

See Magnesium Glycinate.

Chitosan

Description: Chitosan is a type of fiber derived from chitin. The chitin used as a source of chitosan is usually the shells of shrimps, crabs, and so forth.

Uses: Chitosan, when taken orally, binds with dietary fat in the stomach. This prevents the fat from being absorbed into the body. It may exert this action by complexing with lipids because of its opposite electronic charge, and/or by functioning as a bile acid sequestrant, similar to cholestyramine drugs (Questran, Cholestid).

Theoretically, chitosan should be useful as a cholesterol-lowering agent and as a weight loss agent. Its effectiveness in weight loss, however, has yet to be convincingly demonstrated. There is some preliminary research that shows a possible role for chitosan in preventing atherosclerosis, as well as wound healing, diabetes, and liver disease.

Dosage: For cholesterol lowering, 1,000 milligrams, twice a day, with meals, with water.
Indications: Cholesterol problems, weight loss.

Cautions: Chitosan can interfere with the absorption of nutrients and medications, and should not be taken at the same time. If taking chitosan, it is very important to take a full-spectrum multivitamin-multimineral supplement at different times of the day.

Products:
Natrol: Chitosan, 120 capsules. Fat-soluble vitamins (A,D,E, and K) should be taken 4 hours before or after chitosan.

Chlorella

Related Item: Spirulina, blue green algae, chlorophyll.

Description: All green-food supplements are relatively rich in protein, chlorophyll, and carotenoids. Marketing claims to the contrary, there is little documented therapeutic difference among them.

Uses: Green-food concentrates of this type are claimed to have anti-cancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents.

While convincing proof of all of these actions may be lacking, there is certainly no reason not to include one of the green-food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antiox-
idants, and varying amounts of nutrients. The problem with these supplements is that they are often accompanied by exaggerated marketing claims, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.

Cautions: Green-food supplements may be rich in vitamin K, so caution should be exercised if you are taking an anticoagulant medication.

Products:
- Sun: Chlorella Granules, 3 g of chlorella per pack, 20 packs. “Broken cell walls” for easier assimilation.
- Jarrow: Yaeyama Chlorella, 400 mg chlorella, providing “chlorella growth factor,” 150 capsules.

**Chlorophyll**

Related Items: Spirulina, green foods, wheat grass, barley grass, chlorella, blue green algae.
Description: Chlorophyll is the green pigment found in plants, including algae. It is involved in photosynthesis, the process in which a plant converts light and carbon dioxide to carbohydrates and oxygen.
- Chlorophyll is similar in chemical structure to hemoglobin (the heme group); among the differences is that chlorophyll contains magnesium while heme contains iron.
- There are different types of chlorophyll, but this may not be of significance in nutritional supplements.
- All green food supplements are relatively rich in protein, chlorophyll, and carotenoids.
- Uses: Chlorophyll-rich green food concentrates are thought to have anticancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification and protective agents.
- The basis for most of these functions of chlorophyll lie in animal testing only, although its use in reducing body odor, fecal odor, gas, and constipation has been verified in a small number of human studies.
- Some preliminary work indicates that chlorophyll may be of some value in preventing calcium oxalate kidney stones.

Indications: Detoxification, immune system, cancer, odor, kidney stones.
Cautions: Green food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.

Products:
- Nature’s Way: Chlorofresh, 50 mg copper chlorophyllin complex from alfalfa, 90 softgels.
- Nature’s Way: Chlorofresh Liquid Mint Flavor, 1 tablespoon equals 50 mg copper chlorophyllin complex from alfalfa, 16 oz.

**Choline**

Related Items: Lecithin, phosphatidylcholine, CDP-choline.
Description: Choline is now recognized as an essential nutrient. It is used in the body to make phosphatidylcholine and sphingomyelin, the structural components of biological membranes, as well as other crucial intercellular compounds. It is also a precursor for acetylcholine biosynthesis, essential to proper brain function, and functions as a methyl donor.
- Uses: Choline is important for the formation and maintenance of normal cellular membranes, brain function, cardiovascular function, and liver function.
- Acetylcholine, one of the major neurotransmitters, requires choline for its synthesis. There is some evidence that inadequate levels of acetylcholine in the brain may lead to certain types of dementia, including Alzheimer’s disease.
- Choline is converted in the body to betaine, which is involved in preventing elevated homocysteine levels, a risk
factor for cardiovascular disease.

In Europe, choline in the form of phosphatidylcholine is widely used for various liver disorders, including fatty liver, hepatitis, cirrhosis, etc.

Choline is available alone or as choline bitartrate, choline citrate, or choline chloride. While these forms provide the highest level of choline per dose, they are not as well tolerated as other forms.

Indications: Alzheimer’s disease, cholesterol problems, liver disorders, hepatitis, manic depression, mental function, Parkinson’s disease, tardive dyskinesia.

Dosage: The amount taken as a supplement can vary over a wide range. The new “dietary reference intake” is 550 milligrams daily and the suggested “upper limit” is 3,500 milligrams daily.

To achieve the level of 550 milligrams daily, you would have to use approximately 770 milligrams of choline chloride, and 1,339 milligrams of choline bitartrate.

Cautions: At high dosage levels, over 3 or 4 grams daily, choline can cause a fishy body odor and gastrointestinal discomfort.

Products:
- Solgar: Choline, 267 mg choline from 650 mg choline bitartrate, kosher and vegetarian, 100 tablets.
- Twinlab: Choline, 350 mg, 350 mg choline from choline bitartrate 100 capsules.

Chondroitin

Related Items: Cartilage, glucosamine.

Description: Chondroitin sulfate is a glycosaminoglycan (GAG), or mucopolysaccharide material that helps to lubricate the joints by drawing water into the area, as well as helping to regenerate collagen and connective tissue.

Uses: Chondroitin has been shown to be useful in treating osteoarthritis and injuries by reducing inflammation, enhancing the regrowth of connective tissue, and cushioning the area within the joint.

It is often used in conjunction with glucosamine sulfate; there is no convincing evidence that taking chondroitin sulfate along with glucosamine sulfate is more effective than taking either one by itself. Combination products seem to work better, but this may be because the total amount of chondroitin and glucosamine is greater than the amount usually taken individually.

Indications: Arthritis, sports injuries.

Dosage: 400 to 500 milligrams, three times a day.

Products:
- Twinlab: CSA, 250 mg, 100% chondroitin sulfate A from bovine trachea, 120 capsules.
- Solgar: Chondroitin sulfate, 600 mg, 60 tablets.

Chromium

Related Item: Chromium picolinate.

Description: Chromium is an essential trace mineral, thought to be necessary for normal carbohydrate metabolism.

Chromium is found in nature in several chemical forms. The most common are the trivalent and hexavalent forms. In food, the trivalent form is predominant, and is often referred to as “GTF chromium.” GTF stands for “glucose tolerance factor.” The other form of chromium, the hexavalent form, is toxic and potentially carcinogenic.

The use of “GTF” in the labeling of chromium dietary supplements is redundant, as all forms of chromium approved for use in foods and supplements are, by definition, GTF-chromium.

Uses: Chromium works with insulin to control blood sugar levels, and seems to be a valuable supplement for
those with diabetes and hypoglycemia. It also seems to help in lowering elevated cholesterol levels.

There is also some interest in chromium supplementation for athletes, to enhance muscle formation and facilitate weight loss. Support for this use remains problematic, as some studies are positive, and others are negative.

Indications: Diabetes, cholesterol problems, weight loss, triglycerides (high), hypoglycemia.

Dosage: Normal dosage is 200 micrograms daily. For those with problems managing glucose levels, and those with blood lipid problems, doses up to 400 micrograms daily may be appropriate. Higher levels are sometimes prescribed by health professionals, but caution should be observed at high doses, over 800 micrograms, especially with the well-absorbed forms such as picolinate.

Chromium is available as a high-chromium brewer’s-type yeast, chromium picolinate, chromium polynicotinate, and chromium chloride. The absorption of the chloride form may be less efficient than the others.

Products:
Solgar: GTF Chromium, yeast derived, vegetarian and kosher, 250 tablets. See individual product listings for other chromium products.

**Chromium Picolinate**

Related Items: Chromium, chromium polynicotinate.

Description: Chromium is an essential trace mineral, thought to be necessary for normal carbohydrate metabolism. It potentiates the action of insulin, and may affect lipid balance.

Chromium is available as an organic complex for enhanced absorption and bioavailability. The three most popular forms are high-chromium brewer’s-type yeast, chromium picolinate, and chromium polynicotinate. Chromium picolinate is a complex formed by reacting picolinic acid, a natural metabolite found in breast milk, related to the B-vitamin niacin, with chromium.

Marketing claims to the contrary, all three forms are well utilized, and there is little evidence that one is substantially better than the other.

Uses: Chromium works with insulin to control blood sugar levels and seems to be a valuable supplement for those with diabetes and hypoglycemia. It also seems to help in lowering elevated cholesterol levels.

There is also some interest in chromium supplementation for athletes, to enhance muscle formation and facilitate weight loss. Support for this use remains problematic, as some studies are positive and others are negative.

Indications: Diabetes, cholesterol problems, weight loss, triglycerides (high), hypoglycemia.

Dosage: Normal dosage is 200 micrograms daily. For those with problems managing glucose levels, and those with blood lipid problems, doses up to 400 micrograms daily may be appropriate. Higher levels are sometimes prescribed by health professionals, but caution should be observed at high doses, over 800 micrograms, even though some research has shown high levels to be beneficial and safe.

Products:
Twinecal: Chronic Fuel, 200 mcg yeast-free chromium, 200 capsules.
Solgar: Chromium Picolinate, 500 mcg, 500 mcg yeast-free chromium, 120 vegicaps.

**Chromium Polynicotinate**

Related Items: Chromium, chromium picolinate.

Description: Chromium is an essential trace mineral, thought to be necessary for normal carbohydrate metabolism. It potentiates the action of insulin, and may affect lipid balance.

Chromium is available as an organic complex for enhanced absorption and bioavailability. The three most popular forms are high-chromium brewer’s-type yeast, chromium picolinate, and chromium polynicotinate. Marketing claims to the contrary, all three forms are well utilized, and there is little evidence that one is better than the other.

Uses: Chromium works with insulin to control blood sugar levels and seems to be a valuable supplement for
those with diabetes and hypoglycemia. It also seems to help in lowering elevated cholesterol levels.
There is also some interest in chromium supplementation for athletes, to enhance muscle formation and facilitate weight loss. Support for this use remains problematic, as some studies are positive and others are negative.
Indications: Diabetes, cholesterol problems, weight loss, triglycerides (high), hypoglycemia.
Dosage: Normal dosage is 200 micrograms daily. For those with problems managing glucose levels, and those with blood lipid problems, doses up to 400 micrograms daily may be appropriate. Higher levels are sometimes prescribed by health professionals, but caution should be observed at high doses, over 800 micrograms, even though some research has shown high levels to be beneficial and safe.
Products:
Solgar: Chromium Polynicotinate, 200 mcg, ChromeMate form of GTF chromium, 100 vegicaps.

CLA

See Conjugated Linoleic Acid.

CMO

See Cetyl Myristoleate.

Cobalamin

See Vitamin B12.

Cod Liver Oil

Description: Cod liver oil is, as the name implies, derived from cod liver. It is rich in omega-3 oils, which is good. It is also rich in vitamin A and vitamin D, which can be good, up to a point.
Uses: Cod liver oil is an excellent source of vitamin A, vitamin D, and omega-3 oils (EPA and DHA). And it is now available in numerous, palatable variations—regular, emulsified, and flavored.
The problem is that some people might make the mistake of thinking cod liver oil is just another type of fish oil, and that it can be used the same way EPA-DHA fish oils are used. This can be a mistake.
One teaspoonful of cod liver oil supplies 4,600 IU of vitamin A (preformed vitamin A), and 460 IU of vitamin D. If you are already getting up to 4,000 or 5,000 IU of preformed vitamin A, or 400 IU of vitamin D in your daily multivitamin supplement, one teaspoonful of cod liver oil is the maximum amount that should be taken. More than that could result in too much A and D.
With omega-3 rich fish oil supplements, you can take as much as you want. While cod liver oil also contains omega-3 fatty acids, you are limited in how much cod liver oil you can use for that purpose.
Products:
Carlson: Cod Liver Oil Lemon Flavor, 2,250 IU vitamin A, 450 IU vitamin D, 480 mg EPA, 525 mg DHA per teaspoon, 8.9 oz liquid. Norwegian cod liver oil.
Sonne: Cod Liver Oil #5, 4,000 IU vitamin A, 400 IU vitamin D, 400 mg EPA, 400 mg DHA per 5 ml, 16 oz liquid.
Twinlab: Cod Liver Oil, 2,500 IU vitamin A, 164 IU vitamin D, 74 mg EPA, 77 mg DHA per 2 capsules, 250 capsules. Norwegian cod liver oil.
Coenzyme Q10

See CoQ10.

Coleus Forskohlii

Related Item: Forskolin.

Description: Coleus forskohlii (Makandi) is an herb native to India. It contains forskolin, a substance that exerts hypotensive and other cell-regulating actions through the activation of an enzyme called adenylate cyclase. This enzyme regulates the amount of cyclic AMP in cells, which, in turn, activates numerous other enzymes.

Uses: There has been a great deal of interest in this herb as a possible treatment for asthma, glaucoma, obesity, psoriasis, and various cardiovascular problems, including hypertension, congestive heart failure, and cardiomyopathy.

Unfortunately, most of the research has been done with isolated forskolin, not coleus. In addition, some of the work involved topical application, injection, and inhalation, rather than oral administration.

There is good reason to think that oral administration of coleus preparations standardized to 18 percent forskolin will prove effective in many of these conditions.

Indications: Asthma, cardiovascular disease, glaucoma, psoriasis.

Dosage: The usual dose of the standardized 18 percent coleus extract is 50 milligrams two or three times daily. Higher amounts are sometimes used.

Products:
   - America’s Finest: Coleus Forskohlii, 100 mg coleus forskohlii extract (10%), providing 10 mg forskolin, 30 capsules.
   - Gaia Herbs: Coleus Forskohlii Liquid, 170 mg coleus forskohlii extract (2.5%), providing 4 mg forskolin, 2 oz.
   - Enzymatic Therapy: Coleus Forskohlii, 50 mg coleus forskohlii extract (18%), providing 9 mg forskolin, 60 capsules.

Colloidal Minerals

Description: Colloidal mineral supplements were dilute liquid suspensions of minerals derived from humic shale, inland sea beds, plants, or whatever other exotic source the marketing people could imagine. The minerals were supposed to be in colloidal suspension, but this was often not the case. It matters little, in fact. Despite claims shrouded in complex-sounding terminology and too-good-to-believe testimonials, the products were nothing more than very dilute suspensions or solutions of trace minerals. Very dilute is the key, for if all you have is a trace amount of any given mineral, it does not matter how well it may or may not be absorbed—you still have only a trace amount. Unfortunately, you also often had trace amounts of undesirable minerals as well, including aluminum, lead, and arsenic.

Uses: There is no valid use for this product.

Colostrum

Related Items: Lactoferrin, immunoglobulin.

Description: Colostrum is the liquid secreted by the mammary glands during the first day or two after giving birth. It is rich in immune factors, growth factors, proteins, and other nutrients designed to protect the newborn against infection and to stimulate growth.

Uses: Supplements contain bovine colostrum, which is derived from cows. Theoretically, these various immune-
enhancing and growth-stimulating factors might be effective in humans as well, but actual evidence for this remains scarce.

Indications: Immune system, diarrhea, weight loss.

Products:
- Jarrow: Colostrum Specific, 500 mg freeze-dried colostrum (491,000 cryptosporidium parvum binding Units), enteric coated, 60 capsules.
- Symbiotics: New Life Colostrum, 120 capsules. Also available in powder form.

**Conjugated Linoleic Acid**

Description: Conjugated linoleic acid (CLA) refers to a group of fatty acids similar in structure to the essential fatty acid linoleic acid. They differ from linoleic acid in that each isomer contains a conjugated double bond (two double bonds separated by a single bond).

Uses: Based primarily upon animal studies and laboratory work, CLA is thought to be of value in preventing and treating various types of cancer, cardiovascular disease, including elevated cholesterol and triglycerides, and Type 2 diabetes.

CLA seems to be uniquely beneficial in weight loss in that it seems to facilitate the redistribution of fat to lean body mass, or muscle.

People on low-fat diets may be inducing a subclinical deficiency of CLA, and supplementation may be appropriate.


Dosage: The typical dose is 1 to 2 grams daily; up to 6 grams daily have been used.

Products:
- Twinlab: CLA Fuel, 1,000 mg, 1,000 mg CLA from pharmaceutical grade safflower oil, 120 softgels.
- Jarrow: Tonalin® CLA, 750 mg, 750 mg CLA from 1,000 mg sunflower oil, 100 softgels.

**Copper**

Description: Copper is an essential trace mineral. It is involved in many key enzymatic reactions. Copper is required for the absorption and utilization of iron. It is needed for formation of collagen and elastin. It is a component of superoxide dismutase, an antioxidant enzyme.

Uses: Copper has antioxidant action in the body, and maintaining the proper balance of copper to other essential minerals is very important.

There is no question that a deficiency of copper can contribute to cardiovascular disease. Deficiency may also result in impaired immune function and arthritic symptoms.

Supplementation with copper, however, should be limited to the correction or prevention of a deficiency. Use of higher doses of copper as a therapeutic agent in these conditions is not recommended, as high levels can be toxic.

Prolonged supplementation with high doses of zinc can cause a deficiency of copper.

Indications: Nutritional support, cardiovascular disease.

Dosage: The usual dose of copper is 1 to 3 milligrams daily.

Copper is available in several forms in supplements. The one form that may be poorly absorbed is cupric oxide. Other forms, even inorganic forms such as copper sulfate, are better utilized. Chelated copper (glycinate) is also available, as is copper gluconate. These are excellent sources of copper.

However, in most instances, the 2 to 3 milligrams of copper that are necessary will be obtained from your balanced multivitamin supplement. Many reputable companies will add a small amount of copper to their higher-potency zinc-containing supplements. Check the label to see how much copper is present before you take additional copper.
CoQ10

Description: Coenzyme Q10 (CoQ10) belongs to a group of compounds called ubiquinones. These are fat-soluble substances involved in electron transport and energy production in the cell’s mitochondria.

Uses: There seems little doubt that CoQ10 is cardioprotective. It is useful in various types of cardiovascular disease, particularly congestive heart failure, angina, and hypertension. It has been shown to be beneficial in the treatment of periodontal disease.

Certain drugs, such as HMG-CoA reductase inhibitors (Mevacor, Lipitor, and other “statin drugs”), used to lower cholesterol, also significantly lower the body’s level of CoQ10. Supplemenal CoQ10 should be administered along with drugs of that type.

Other conditions that might benefit from CoQ10 supplementation are diabetes, cancer, and Alzheimer’s disease. CoQ10 may also enhance athletic performance.

Indications: Cardiovascular disease, periodontal disease, angina, hypertension.

Dosage: The commonly used dosage now varies between 30 and 200 milligrams daily.

The product is available in a dry powder form (capsules and tablets), as well as oil-based softgels. Whereas CoQ10 is fat-soluble, the absorption of the oil-based softgel form is claimed to be significantly better than the dry form. On the other hand, if the dry form is taken with meals, the absorption will be facilitated as well. There are products that include a special black pepper extract (Bioperine) that seems to increase absorption of CoQ10 as well.

It should be pointed out, also, that it may take up to three weeks of supplementation to reach maximum blood levels of CoQ10.

Products:
- Country Life: Maxi Sorb CoQ10, 30 mg, “Q-Gel” process, 90 softgels. Claims 4 times the absorption of powdered CoQ10 when taken on an empty stomach.
- Jarrow: Q Sorb CoQ10, 100 mg CoQ10, 4 mg gamma-tocopherol, in “Q Sorb” delivery system, 60 softgels. Claims to raise plasma levels 28% more than dry CoQ10.
- Twinlab: Twinsorb CoQ10, 50 mg, “Twinsorb” process, 60 softgels. Claims to be 9 times more absorbable than powdered CoQ10.
- Allergy Research: CoQ10, with tocotrienols, 100 mg CoQ10 and 25 mg tocotrienols in rice bran oil, 60 softgels.
- Carlson: CoQ10, 50 mg, 60 softgels.
- Doctor’s Best: CoQ10, 100 mg CoQ10 and 1.5 mg bioperine, which enhances the absorption of CoQ10, 60 softgels.
- Solgar: CoQ10, 120 mg, vegetarian and kosher, dry-form CoQ10, 60 vegicaps.
- Jarrow: CoQ10, 60 mg, dry-form CoQ10, 60 capsules.
- Twinlab: Mega CoQ10, 30 mg, dry-form CoQ10, 100 capsules.

Cordyceps

Description: Cordyceps (Cordyceps sinensis) is a type of mushroom that is highly prized in Chinese medicine. It was very rare in the past because it grows naturally on a particular species of caterpillar. But a method of cultivating it commercially, using a fermentation process, has allowed it to be mass produced.
Uses: In China, cordyceps is considered a longevity and vitality tonic. It is being used now to support respiratory system function and as a cancer treatment. It may also be of value in ameliorating the side effects of chemotherapy and radiation treatment. It is thought to have antioxidant activity, and may function as a detoxification agent, particularly through its support of kidney function.

Indications: Anti-aging, athletic performance, cancer, asthma, chronic fatigue syndrome, energy (low).

Products:
- Doctor’s Best: Ultra Cordyceps Plus, 750 mg cordyceps, providing 8% (60 mg) cordycepic acid, 30 mg ginkgo ext, and 30 mg artichoke leaf ext (2-5% cynarin), 60 capsules.
- Solaray: Cordyceps, 520 mg, 100 capsules.
- Metabolic Response Modifiers: Cordyceps, 750 mg, 60 capsules.

**Coriolus Versicolor Extract**

Related Item: Trametes Versicolor.

Description: Coriolus versicolor extract is derived from a mushroom commonly known as the “turkey tail” in North America. It is also referred to as cloud fungus, and Trametes versicolor.

Uses: This product, also known as PSK, or crestin, is promoted in Japan as a treatment for cancer. It is claimed to have a normalizing effect on immune system function, and is thought to work synergistically with other immune-enhancing or cancer-fighting agents.

As is the case for many of the other mushroom extracts in this category, Coriolus versicolor is rich in beta-glucans.

PSK is a water-soluble extract of the mushroom, with beta-1, 4-glucan as the main component. Another extract, PSP, has been used as well, and it is referred to as coriolan.

Indications: Cancer, immune system.

Products:
- Maitake Products: Turkey Tail, 500 mg fruit body powder, 300 mg (20:1), extract, ginger, maitake d-fraction, vitamin C, and bioperine per 4 capsules, 120 tablets.
- JHS Natural Products: Coriolus Versicolor Extract, cell wall extract from 625 mg Coriolus versicolor fruit body, 150 vegicaps.

**Cranberry**

Description: Cranberry (Vaccinium macrocarponum) is a sturdy plant that grows wild in North America. It belongs to the same genus as blueberry and bilberry.

Uses: Cranberry has a long history of medicinal and food use by Native Americans. Its traditional use in treating urinary tract infections has now been substantiated by modern research. The explanation lies in its ability to prevent disease-causing bacteria from adhering to the walls of the urinary tract.

In addition, cranberry is very rich in flavonoid antioxidants, including proanthocyanidins and vitamin C. In fact, a recent study of the antioxidant properties of fruits revealed that cranberry had the highest level of activity.

The benefits of cranberry can be obtained from drinking cranberry juice, but unsweetened juice should be used, rather than the diluted, heavily sweetened products available in grocery stores. As an alternative, concentrated capsules are available.

Products:
- Jarrow: Cran Clearance, 650 mg cranberry concentrate (10:1), 30 mg vitamin C, 100 capsules.
- Solaray: Cran Actin, 400 mg “Cranactin Cranberry AF Extract,” 120 capsules.
Creatine

Description: Creatine is a nitrogen-containing compound. In the body, it is formed in the liver and converted to phosphocreatine in muscle, where it serves as a source of high-energy fuel for muscle contraction.

Uses: Creatine supplementation seems to enhance short-term (anerobic) exercise performance. It has shown benefit in most, but not all, studies involving high intensity, short duration physical activities. If creatine is the fuel used by muscle, supplemental creatine can be thought of as preventing the tank from hitting empty too quickly. This may allow athletes to train a little longer, for example, resulting in enhanced performance. It has also been shown to result in increased muscle mass. This may be due to enhanced training—that is, creatine allowing a weight lifter to work a little harder and longer, although some feel that this is more a result of hydration of muscle tissue, rather than actual generation of additional muscle. Perhaps there is some of both.

Indications: Urinary tract infections, periodontal disease, kidney stones.
Creatine is available in supplements as creatine monohydrate powder.
Indications: Athletic performance, cardiovascular disease.
Dosage: The usual dose is 20 grams a day for up to five days, followed by a maintenance dose of 2 to 5 grams daily. The initial, higher dose, is intended to “load” the muscle rapidly with maximum levels of creatine. Then, the lower dose maintains these levels. Some feel that taking creatine with a small amount of carbohydrate will enhance its uptake into muscle tissue.

Cautions: High doses should not be taken by those with compromised renal (kidney) function. Long-term effects of high doses of creatine have not been determined. The powder should be taken with ample amounts of water—six to eight glasses per day. Large amounts of caffeine may counter the beneficial effects of creatine.
Recent research has shown that creatine does not increase the risk of injury in athletes.

Products:
- Jarrow: Creatine Powder, creatine monohydrate, 325 g.
- Twinlab: Creatine Fuel Capsules, 4,200 mg creatine monohydrate in 6 capsules, 120 capsules.
- NOW Foods: Creatine Crave Chewy Chocolate, 1,500 mg creatine monohydrate per chew, 60 chews.

Cryptoxanthin

See: Carotenoids.

Curcumin

Related Item: Turmeric.
Description: Curcumin is the principal medicinal component on the herb turmeric. Turmeric is a tropical plant native to south and southeast Asia. The curcuminoids in turmeric are deep yellow in color, and are what contribute to the yellow color of foods and spices such as mustard and curry.

Uses: Curcumin and turmeric extracts have powerful antioxidant and anti-inflammatory action. It is useful in treating arthritis, including rheumatoid arthritis. It lowers cholesterol, prevents the oxidation of blood lipids, and inhibits platelet aggregation. Historically, it has been used for indigestion, and as a stimulant to bile production and liver function.

Considerable animal and laboratory research indicates that curcumin may have a significant anticancer activity and immune-stimulating capability.

Animal studies have even shown that curcumin may prevent the development of cataracts.
Indications: Arthritis, cardiovascular disease, cancer, cataracts, digestive aid, immune system.
Dosage: Take 400 to 600 milligrams of curcumin three times daily, for maximum effect, with meals. Lower doses may be sufficient, and standardized turmeric extracts are often used, at two or three capsules daily, with meals.
Cautions: Curcumin may enhance the anticoagulant effect of anti-coagulant medications.

Products:
- Nature’s Herb’s: Curcumin Power, 300 mg curcumin (95% curcuminoids) and 145 mg turmeric root powder, 60 capsules.
- Jarrow: Curcumin 95, 380 mg of an 18:1 concentrate of curcumin (95% curcuminoids), 60 capsules.

**Cysteine**

Related Items: NAC, N-acetyl-cysteine, glutathione.
Description: L-cysteine is a nonessential, sulfur-containing amino acid.

Uses: Cysteine is not considered “essential” because it can be made in the body from another amino acid, methionine.

Cysteine is an important constituent of connective tissue, hair, skin, and nails. It is an antioxidant, and a precursor to the formation of glutathione. It also seems to play a role in immune system function. As a supplement, cysteine has drawbacks. It readily absorbs moisture and oxidizes, and this leads to stability problems and a limited shelf life. Instead, a derivative of cysteine, N-acetyl cysteine (NAC), may be a better way to obtain supplemental cysteine. See N-acetyl cysteine for more information.

Products:
- Solgar: Cysteine, 500 mg, vegetarian and kosher, 90 vegicaps.
- Twinlab: Cysteine, 500 mg, 60 capsules.

**Deglycyrrhizinated Licorice**

Related Item: Licorice.
Description: Deglycyrrhizinated licorice (DGL) is an extract of licorice root from which one component, glycyrrhizinic acid, has been removed.

Uses: Licorice has many medicinal properties, and a long history of use in traditional Chinese medicine. It is an anti-inflammatory agent, antimicrobial, expectorant, and adrenal gland tonic. It has been shown to be effective in treating gastric and duodenal ulcers, and may even inhibit the growth of Helicobacter pylori.

Licorice, however, also has certain side effects that limit its usefulness. It can cause elevated blood pressure, water retention, and excess potassium loss in some people. The main component responsible for this is glycyrrhizinic acid. When this component is removed, you have deglycyrrhizinated licorice (DGL), which retains most of the benefits of licorice, without the side effects.

The primary use for DGL is to treat gastric and duodenal ulcers. It appears most effective as a chewable tablet. There is also some evidence that DGL protects the gastric lining from damage caused by aspirin and other NSAIDs (nonsteroidal anti-inflammatory drugs).

Indications: Ulcer (peptic), GERD (gastroesophageal reflux disease), canker sores.
Dosage: Chew one wafer before each meal, and at bedtime.

Products:
- Nature’s Herbs: DGL Power, 760 mg DGL root, standardized to not more than 0.6% glycyrrhizinic acid, and 100 mg glycine, 40 wafers.
- Enzymatic Therapy: DGL chewable, DGL root extract, 3:1, 760 mg DGL and 100 mg glycine per 2 tablets, 100 tablets. Sweetened with fructose.

**Dehydroepiandrosterone**

See DHEA.
Devil’s Claw

Description: Devil’s claw (Harpagophytum procumbens) is native to southern Africa. The fruit of the plant is covered with small claw-like barbs, leading to its unusual name. The secondary tubers are rich in iridoid glucosides (harpagoside, harpagide, and procumbide).

Uses: The German Commission E has approved devil’s claw for loss of appetite, dyspepsia (or indigestion), and “degenerative disorders of the locomotor system.”

Devil’s claw seems to have anti-inflammatory action, and this may explain why it is a popular remedy for arthritis, tendinitis, low back pain, and similar problems.

Indications: Arthritis, indigestion, sports injuries, appetite (loss of).

Dosage: Follow the guidelines on the product label. For loss of appetite, use about one-third the dose indicated for joint inflammation.

Cautions: Devil’s claw is helpful for indigestion, but since it might stimulate gastric acid secretion, it may not be appropriate for heartburn.

Products:
- Nature's Herbs: Devil’s Claw, 510 mg devil’s claw secondary root, 100 capsules.
- Nature’s Answer: Devil’s Claw, Devil’s claw fluid extract (1:1), 2 oz liquid.

DGL

See Deglycyrrhizinated Licorice.

D-Glucarate

Description: D-glucarate is naturally found in some vegetables and fruits, including apples and cruciferous vegetables. It is available in supplement form as the calcium salt, that is, calcium D-glucarate.

Uses: D-glucarate is thought to have anticancer activity. The theory behind this is as follows. Many carcinogens are eliminated from the body when they are complexed, or chemically bound, to other substances. This is one of the liver’s normal functions. This carcinogen, or toxin complex, can either be excreted or retained in the body if the complex is broken apart by certain enzymes. D-glucarate inactivates one of those enzymes, thus increasing the amount of toxin complex that is removed from the body. By enhancing the removal of potentially carcinogenic materials from the body, including estrogen, D-glucarate may help prevent cancer.

This has been shown to be the case in animal studies, and in the laboratory. When human studies are forthcoming, we will have a better feel for its efficacy in this regard, as well as the appropriate dosage.

Indications: Cancer.

Dosage: The usual recommendation is 1,000 milligrams, twice a day, of calcium D-glucarate.

Products:
- Tyler: Calcium D-Glucarate, 500 mg, 90 capsules.

DHA

Related Items: EPA (eicosapentaenoic acid), fish oil, omega-3 oils.

Description: DHA (docosahexaenoic acid) is an omega-3 fatty acid, present in relatively high levels in fish oil. It is abundant in the human brain, and seems to be essential to normal brain, visual, and nervous system development in the fetus. It is the predominant omega-3 fatty acid in breast milk.
Uses: DHA has been shown to lower elevated triglycerides. In Indications: Triglycerides (high), this regard, its actions seems to be equivalent to other omega-3 supplements, such as EPA and fish oil (containing both EPA and DHA). There is some concern, however, over its effect on LDL cholesterol, and while it may lower total triglycerides, it may not exert a beneficial effect on the ratio of desirable to undesirable cholesterol fractions. Administration of other LDL-lowering supplements, such as water-soluble fiber, niacin, garlic, and gum guggul, along with the fish oil may ameliorate this concern.

DHA is more uniquely indicated in other situations. It appears to be essential during pregnancy and nursing, and is now being added to infant formulas.

Research is ongoing to verify the role of DHA in treating several specific problems—attention deficit disorder, cystic fibrosis, dyslexia, Alzheimer’s disease, Zellweger’s syndrome, rheumatoid arthritis, depression, and autoimmune disorders such as lupus and psoriasis.

Many nutritionists believe that there is a relative deficiency of EPA and DHA in the general population owing to the increased intake of omega-6 oils (processed vegetable oils) and trans fatty acids. This can suppress the normal conversion of omega-3 oils to EPA and DHA. These conversions can be further impaired if there is a deficiency of certain nutrients, such as vitamins C, B6, niacin, and zinc.

DHA can be obtained in supplement form derived from fish oil, or from phytoplankton (algae). It can also be formed in the body, with varying degrees of efficiency, from alpha-linolenic acid, which is converted first to EPA and then to DHA. Flaxseed oil is often recommended as a rich source of alpha-linolenic acid (ALA). Most fish oil supplements contain about 12 percent DHA.

Indications: Triglycerides (high).
Dosage: For elevated triglycerides, 1 to 2 grams daily.
Cautions: All omega-3 oils have some antithrombotic activity. This is generally advantageous. Those already taking anticoagulant medications (Coumadin), however, should exercise caution.

Products:
- Solgar: DHA, 100 mg, Neuromins®, 100 mg DHA derived from 500 mg DHA-rich oil, 60 softgels.
- Source Naturals: DHA, 200 mg, Neuromins®, 200 mg DHA derived from algal oil, 60 softgels.
- Jarrow: MaxDHA, 500 mg sardine oil providing 250 mg DHA and 100 mg EPA, 180 softgels.
- Carlson: Super-DHA, 1,000 mg fish body oil concentrate providing 500 mg DHA and 200 mg EPA, 60 softgels.

DHEA

Related Item: Androstenedione.

Description: Dehydroepiandrosterone (DHEA) is a hormone normally produced by the adrenal glands. It circulates throughout the bloodstream and is converted by the body into other steroid hormones, such as testosterone, androstenedione, and estrogen.

Uses: The use of DHEA as a dietary supplement remains controversial. It is a hormone, or hormone precursor, not a nutrient. Original claims by some that Mexican or wild yam was a dietary source of DHEA or DHEA precursors were false.

There is no question that DHEA is a key component in the body’s complex regulatory mechanism. We know, for example, that levels of DHEA (or more correctly, DHEAS) are lower in individuals with chronic disease. And we know that levels of DHEA peak at age 25 and then steadily decline up to age 70. What we do not know for sure is whether or not it is beneficial to artificially boost levels of DHEA in an older person to what they were before. Nor do we know what the ramifications are of boosting levels over what they would normally be during the younger years. And we do not know what long-term effects might result from boosting DHEA levels through supplementation. In fact, there is quite a bit we do not know about the effects and possible side effects of DHEA supplementation. For this reason, many feel that supplementation with DHEA should be undertaken only under the
In spite of this, the lure of DHEA’s possible benefits has proven irresistible to many, including many researchers. Is DHEA really the miraculous anti-aging compound that some claim it is? It remains to be seen. Its effects differ, depending on gender and age. There is some evidence that DHEA supplementation may help those with depression, erectile dysfunction, fatigue, depressed immune system function, and certain symptoms associated with menopause. Other studies support the contention that DHEA supplementation results in increased lean body mass, improved mood, and an increased sense of well-being.

**Indications:** Sexual performance, anti-aging, chronic fatigue syndrome.

**Dosage:** The usual dosage is 25 to 50 milligrams daily for men, and perhaps less for women.

**Cautions:** Prudence dictates that DHEA supplementation is best undertaken only on the advice and guidance of a physician. Higher dosage levels should definitely not be used without medical supervision. The long-term effects of DHEA supplementation are unknown.

Those who are at risk for prostate, breast, uterine, or ovarian cancer should not take DHEA.

The most common adverse reactions seem to be androgenic effects, such as acne and increased facial hair.

**Products:**
- Jarrow: DHEA, 50 mg, pharmaceutical grade, 90 capsules. NOTE: Products are available from various manufacturers in dosages of 5 mg, 10 mg, 15 mg, 25 mg, 25 mg TR, 25 mg sublingual, 50 mg, 50 mg TR.
- Natrol: DHEA, 25 mg, 90 capsules.
- Natrol: DHEA, 10 mg, 30 tablets.

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**Dibencozide**

**Related Items:** Cobalamin, vitamin B12, methylcobalamin.

**Description:** Dibencozide is a name for one of the two coenzyme forms of vitamin B12 adenosylcobalamin (5-deoxyadenosylcobalamin). The other coenzyme form of vitamin B12 is methylcobalamin.

**Uses:** This particular form of B12 is sometimes marketed to body-builders and athletes, apparently as an energy aid and muscle-building agent. Unfortunately, the support for this is mostly anecdotal.

Dibencozide, or adenosylcobalamin, is a cofactor for the enzyme L-methylmalonyl coenzyme A mutase, while the other coenzyme form of B12, methylcobalamin, is a cofactor for the enzyme methionine synthase.

If the only purpose of supplementing with this nutrient is muscle building and energy, perhaps there is some justification for using only the dibencozide form of vitamin B12. Even though, again, the effectiveness of this is based primarily on theoretical and anecdotal evidence. But if the purpose is to obtain an effective, well-absorbed dose of vitamin B12, we question the advisability of using only one of the two coenzyme forms. Instead, taking a high dose of cobalamin (or hydroxocobalamin) might be more beneficial.

**Products:**
- Source Naturals: Dibencozide, 10,000 mcg, sublingual, 60 tablets. Dibencozide provides 6,800 mcg of vitamin B12.
- Country Life: Active B.12 Dibencozide, 3,000 mcg with folic acid, 3,000 mcg vitamin B12 from dibencozide and 200 mcg folic acid, 60 lozenges.
- Solgar: B.12 Megasorb Nuggets, 5,000 mcg, 5,000 mcg cobalamin and 100 mcg dibencozide, 60 tablets.

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**Dimethylglycine**

See DMG.
DLPA

See DL-Phenylalanine.

**DL-Phenylalanine**

Related Item: L-Phenylalanine.

Description: DL-Phenylalanine, also referred to as DLPA, is a racemic mixture consisting of equal amounts of D-phenylalanine and L-phenylalanine. These are both amino acids, but only the L-form is used in protein synthesis.

Uses: DL-phenylalanine is thought to have analgesic and an Indications: Pain, depression, sedative property. The antidepressant action is probably due to the presence of L-phenylalanine, while the analgesic activity results from the D-form.

L-phenylalanine is a precursor to L-tyrosine, which in turn is a precursor to the neurotransmitters norepinephrine and dopamine. Increased levels of these neurotransmitter substances are thought to be associated with mood elevation and antidepressant effects.

D-phenylalanine may block pain by interfering with the degradation of natural enkephalins.

DLPA seems to be most useful as a long-term adjunct to the treatment of chronic pain.

Dosage: Typically, between 375 and 2,500 milligrams can be used, preferably under the supervision of a health professional. Take between meals.

Cautions: DL-phenylalanine is contraindicated in those with phenylketonuria, and those taking nonselective monoamine oxidase (MAO) inhibitors.

Products:
- Solgar: DLPA, 500 mg, vegetarian and kosher, 100 vegicaps.
- Country Life: DLPA, 1,000 mg, 1,000 mg DLPA and 10 mg vitamin B6, 60 capsules.

**DMG**

Description: Dimethylglycine (DMG) is a nonprotein amino acid, found naturally in animal and plant tissue. Its proper chemical name is N,N-dimethylglycine, although in the past it has been known as pangamic acid, calcium pangamate, and vitamin B15.

Uses: DMG was initially popular as a supplement because of claims that it enhanced cellular oxygenation, increased stamina, and boosted energy. Subsequent research has failed to support these claims. On the other hand, there is some preliminary evidence supporting DMG as an immune system enhancer. Of course, we have many other supplements that enhance the immune response, and their efficacy is well documented.

Cautions: DMG is not the same as TMG (betaine, or trimethylglycine), although DMG can be formed in the body from TMG.

Products:
- Country Life: DMG, 125 mg, 90 tablets.
- Da Vinci: Gluconic DMG, 125 mg, 90 tablets.

**Docosahexaenoic Acid**

See DHA.
Dolomite

Related Item: Calcium.
Description: Dolomite is a mineral containing calcium and magnesium carbonate, along with other naturally occurring trace and heavy metals. It is also known as magnesium limestone.
Uses: Dolomite was once popular as a nutritional supplement. However, it contains naturally high levels of lead, mercury, and other toxic minerals. With so many other calcium and magnesium supplements available, there is no reason to use dolomite.

EPA

See Fish Oil.

Echinacea

Description: Echinacea, also known as “purple coneflower,” is one of the most popular herbs used as an immune system stimulant. Its use dates back to the American Indians. Three species are commonly used: Echinacea purpurea, Echinacea angustifolia, and Echinacea pallida.
Marketing claims to the contrary, there is no evidence that one species is more effective than another, and there is also no evidence that one part of the plant (roots, leaves) is more effective than another. There is also no evidence that wild echinacea is any better or worse than cultivated echinacea.
Uses: Echinacea has been shown to enhance immune system activity. It is thought that it exerts this effect primarily through stimulating the action of white blood cells, which attack and destroy invading organisms (phagocytosis).
When taken at the first signs of infections echinacea will shorten the duration and severity of cold and flu symptoms.
Echinacea has also been used to treat wounds and other skin ailments.
Indications: Cold and flu, immune system.
Cautions: Some suggest that echinacea should not be used by those with autoimmune diseases, but there is some controversy as to whether or not this is a valid concern.
Products:
Nature’s Herbs: Echinacea Power, 250 mg echinacea root extract (3.2-4.8% echinasides), 50 mg echinacea angustifolia, 50 mg Echinacea purpurea, and 680 mg Parthenium root per 2 capsules, 60 capsules.
Nature’s Answer: Echinacea Liquid, 500 mg echinacea angustifolia root, 500 mg Echinacea purpurea whole plant in 28 drops, contains 20 mg of total phenols, 2 oz.
Solgar: Echinacea Vegicaps, 65 mg Echinacea purpurea root extract (4:1), 265 mg raw echinacea aerial powder, 135 IU vitamin A, vegetarian and kosher, 250 vegicaps.
Nature’s Way: Echinaguard, 2 ml Echinaguard liquid, the expressed juice from the stem, leaf, and flower of Echinacea purpurea per 2.5, ml, 4 oz liquid.

Effervescent Vitamin C

Related Item: Buffered vitamin C.
Description: When a mixture of ascorbic acid, citric acid, and mineral bicarbonate is added to water, the citric and ascorbic acids react with the bicarbonate, releasing carbon dioxide, that is, it “fizzes.” To some degree, the ascorbic acid will be converted to mineral ascorbates.
Uses: Some find this a more palatable alternative to tablets and capsules as a source of supplemental vitamin C. To the extent that the vitamin C is converted to mineral ascorbates, the acidic nature will be neutralized, creating a “buffered vitamin C.”

Products:
- Allergy Research: Buffered Vitamin C Powder, 900 mg vitamin C as calcium, magnesium, and potassium ascorbates per 1/2 teaspoon, 240 grams. This product contains vitamin C and mineral carbonates, which react when added to water. It is hypoallergenic and produces a moderate fizz. This same formulation is available in capsule form.
- Alacer: Emergen-C, 1,000 mg vitamin C as mineral ascorbates and all the B vitamins, per packet, 36 packets. This product is a mixture of bicarbonates, vitamin C, and citric acid, resulting in a pronounced fizz. It comes in numerous flavors.

**Elderberry**

Description: Supplements of elderberry (Sambucus nigra) contain extracts of the flower or berry of the elder tree. Its medicinal use dates back to Rome and Greece. It is rich in flavonoids, including quercetin and rutin.

Uses: Elderberry extract has been used widely in Europe to treat colds and flu, especially when accompanied by fever and congestion. Studies in Israel support its supposed antiviral activity.

Indications: Cold and flu, immune system.

Products:
- Nature’s Way: Sambucol, 2 teaspoons contain 3.8 g elderberry extract, 4 oz liquid.
- Nature’s Way: Sambucol Lozenges, 130 mg elderberry dried extract and 100 mg vitamin C, 30 lozenges.

**Emu Oil**

Description: Emu oil is obtained from the fat of the emu, a bird native to Australia.

Uses: Enthusiastic claims were made that this oil would cure arthritis, heal wounds, relieve muscle pain, and eliminate wrinkles. It almost seemed too good to be true. Apparently, it was. There is no valid use for this product.

**Ephedra**

Description: Ephedra, or ma huang, is a plant found in desert regions throughout the world. It has been used as a medicinal herb for over 5,000 years, and is one of the stalwarts of traditional Chinese medicine. Its two most important medicinal constituents are the alkaloids ephedrine and pseudoephedrine.

Uses: There is no question that ephedra is a valuable, effective medicinal herb. Traditionally, it has been used for respiratory conditions (asthma, hay fever, coughing, emphysema, congestion), colds, fevers, and other problems (nephritis, headache). During this long history of successful use, safety and toxicity have never been considered a problem.

Over the last few years, however, the safety of ephedra supplements has been one of the main concerns of various regulatory agencies. Some have demanded that the availability of ephedra-containing products be severely restricted.

Why would an herb with such a long history of safety and efficacy now be under regulatory attack?

The problem stems primarily from irresponsible marketing and use of two types of ephedra-containing products. One is the “recreational” ephedra product, which is designed for nonmedical purposes (creating a “high,” euphoria and enhancing sexual pleasure). The other is the weight loss supplement, where ephedra or ephedra alkaloids are combined with caffeine to exert a powerful thermogenic effect.
When used responsibly, the benefits of ephedra far outweigh any concerns over safety. But when used improperly, the potential for problems is significant.

These problems are most likely of lesser concern when the whole herb is used, as it has been in traditional herbal medicine. The whole herb contains the two major alkaloids ephedrine and pseudoephedrine, along with numerous other compounds. When taken in this form, the alkaloids in the whole herb are absorbed more slowly and have a more prolonged effect than the isolated alkaloids.

Many of the products being promoted irresponsibly contain added ephedra alkaloids. When products are spiked with extra alkaloids and with other central nervous system stimulants such as caffeine or caffeine-rich herbs (guarana, kola nut), they exert amphetamine-like action and are more like drugs than herbs.

The major component of ephedra is ephedrine. Ephedrine is categorized as a “sympathomimetic,” a substance that stimulates the sympathetic nervous system. If you think back to your early lessons in biology, you might remember the “fight or flight” syndrome. This is a way of describing what happens when you stimulate the sympathetic nervous system, releasing adrenaline from the adrenal gland. Body functions that might hinder your ability to fight or flee are depressed. This would include reducing stomach and gastrointestinal motility, constricting the urinary sphincter, dilating the pupil of the eye, and constricting systemic blood vessels. At the same time, other functions would be stimulated, such as heart rate and contraction strength, coronary blood vessel dilation, and bronchiole dilation.

Well, this is all very nice, but what does it have to do with ephedra? If you have hay fever, and nasal congestion, the sympathomimetic action of ephedra (constricting the tissue in the nose) is something you benefit from. If you have asthma, or emphysema, the bronchiole-dilating actions of ephedra is something you benefit from. But if you have high blood pressure, constriction of peripheral blood vessels may make it worse. If you have benign prostatic hyperplasia, the last thing you want is to take something that might further constrict the urinary sphincter. Thus, the concern with side effects.

The more pronounced the activity of any herb (or drug), the more potential for side effects. The likelihood that whole-herb ephedra, or ma huang, will cause these problems is slight, but when additional ephedra is added to the product, the likelihood increases.

Responsible manufacturers should indicate on the label whether or not additional ephedra has been added, and the product should indicate the level of ephedra alkaloids. Currently, standardized ephedra products are available, usually at a level of 6 to 8 percent ephedra alkaloids, and such products are preferred to those with no quantitative information.

There are two primary uses for ephedra supplements that merit consideration. As a treatment for respiratory problems, nasal congestion, sinusitis, and perhaps mild asthma, we see no problem with using reasonable amounts of standardized ephedra supplements. There is little question that a combination of ephedra and caffeine can facilitate weight loss. It seems to exert a pronounced thermogenic action, and, to some degree, an appetite suppressant effect. But this combination more closely resembles a drug than an herb, and should be used only if necessary, preferably under the guidance of a health professional. It should not be considered a “miracle” pill, replacing the need for exercise, behavior modification, and dietary changes.

Indications: Cold and flu, obesity, weight loss, allergies, sinusitis.

Dosage: Ephedra is available in capsule and tablet form, standardized and unstandardized, as well as extracts and tinctures. A prudent dose should not exceed the equivalent of 12 to 25 milligrams total alkaloids (as ephedrine), two or three times a day. It is also available as a tea.

Note: An herb identified as “Mormon tea” (Ephedra nevadensis) is available, but it contains little or no ephedrine. Also, ephedra root does not contain ephedrine. It actually may contain components that counter the action of ephedrine.

Cautions: Responsible manufacturers should include warnings similar to this on the product label:

Ephedra should not be taken by patients with heart disease, high blood pressure, thyroid disease, diabetes, or
difficulty in urination due to enlargement of the prostate. It should not be taken by patients taking antihypertensive and antidepressant medications. Discontinue use if you experience rapid heartbeat, dizziness, severe headache, shortness of breath, or similar problems.

On the other hand, responsible consumers should not take products that claim to produce euphoric sexual enlightenment or melt away 10 pounds a day while you sleep off a Haagen-Dazs-induced soporific coma.

Products: (Ephedra products have been removed from the market)
- Nature’s Answer: Ma Huang Twig Extract, 100 mg ma huang twig extract, providing 8% (8 mg) ephedrine alkaloids, vegetarian and kosher, 100 vegicaps.
- Nature’s Answer: Ma Huang Liquid, 1,000 mg ma huang twig extract, providing 2 mg ephedrine alkaloids per 28 drops, 1 oz.
- Solaray: Ephedra Capsules, 375 mg ephedra aerial parts, providing 3.75–7.5 mg ephedrine alkaloids, 100 capsules.

### Essiac Tea

Description: Essiac is an herbal mixture developed by a nurse, Rene Caisse, containing burdock root, sheep sorrel, slippery elm, and Turkey rhubarb.

Uses: This product, and the variations thereof, are claimed to be “cures” for cancer. While convincing evidence of its “curative” properties remains lacking, there is an impressive array of anecdotal reports of improvement when used by cancer patients.

It is difficult to separate fact from fiction when it comes to competing marketing claims by various companies marketing their versions of the “original” formula. Most likely, such differences are of minimal relevance. The basic formula is agreed upon, and more important, as is the case for all supplements, is the integrity, quality, and reproducibility of the product.

While essiac may not be a “miracle cure” for cancer, as many have claimed, it certainly seems to have some value to those with cancer. It may help—that is, reduce pain, cause some degree of tumor regression, promote an increased sense of well-being, and so on—and seems to cause no harm. There is little reason not to include essiac as part of a comprehensive supplement regimen for the patient with cancer.

Products:
- Flora: Flor Essence Dry, “improved” formula, adds watercress, kelp, blessed thistle, and red clover to original formula, 2.2 oz powder. Needs to be brewed into a tea.
- Flora: Flor Essence Liquid, “improved” formula, adds watercress, kelp, blessed thistle, and red clover to original formula, 17 oz liquid. Ready to use.
- Essiac Int: Essiac Herbal Remedy, “original” Rene Caisse formula made by Resperin Corp. Burdock root, sheep sorrel, slippery elm, and Indian rhubarb root, 1.5 oz powder. Needs to be brewed into a tea.

### Ester-C

Related Item: Vitamin C.

Description: Ester-C refers to a mineral ascorbate and vitamin C metabolite complex. The mineral ascorbate is typically a calcium salt of ascorbic acid (calcium ascorbate), and the predominant metabolite seems to be threonic acid, or calcium L-threonate.

Uses: Ester-C is a patented ascorbate-metabolite complex, and it is claimed to enhance the delivery of vitamin C into the cells of the body. The product is buffered and well tolerated.

The claims of superior utilization are supported primarily by animal and test-tube studies, however. For those who feel they do not tolerate vitamin C products well, or for those to whom optimal absorption is im-
important, an ester-C supplement may be the appropriate choice.

Products:
- Natrol: Ester C 1,000 with Bioflavonoids, 1,000 mg vitamin C as calcium ascorbate, 200 mg lemon bioflavonoids, 180 tablets.
- Natrol: Ester C 500 with Bioflavonoids, 500 mg vitamin C as calcium ascorbate, 200 mg citrus bioflavonoids, 240 capsules.
- Allergy Research: Ester C Magnesium, 500 mg vitamin C as magnesium ascorbate, 100 capsules.
- Twinlab: Ester-C, 1,000 with citrus bioflavonoid complex, 1,000 mg of vitamin C as calcium ascorbate, 200 mg citrus bioflavonoid complex, 100 tablets.

**Evening Primrose Oil**

Related Items: Borage oil, black currant seed oil.
Description: Evening primrose oil is derived from the seed of the evening primrose plant, *Oenothera biennis*, which is native to North America. It contains gamma-linolenic acid (GLA), the precursor to the inflammation-suppressing series 1 prostaglandins.
Uses: Evening primrose oil was the first commercially available source of a GLA-rich oil. Therefore, most of the initial research on the therapeutic value of GLA supplementation was done with evening primrose oil. Later, more potent sources of GLA were brought to market (borage oil, black currant oil), but many nutritionists still recommend evening primrose oil.

GLA (gamma-linolenic acid) is an omega-6 oil. Not all omega-6 oils are bad. The predominant omega-6 oils in the diet—linoleic, linolenic, and arachidonic—can be both detrimental and beneficial. Linoleic acid is essential to life. In the body, these oils are converted into powerful, hormone-like substances called prostaglandins. The omega-6 oils can form two types. One type, the 2 series, is usually detrimental, causing inflammation. The other type, the 1 series, is beneficial, reducing inflammation. The GLA type of omega-6 oil leads to the beneficial, series 1 type of prostaglandin. The beneficial actions of series 1 prostaglandins are similar to those of the series 3 prostaglandins derived from omega-3 oils, ALA (flaxseed oil) and EPA (fish oil). Thus, GLA, from borage, black currant, and evening primrose oil, provides much the same benefit as the omega-3 oils from fish and flaxseed.
Indications: Arthritis (rheumatoid), diabetes, skin disorders, eczema, fibrocystic breast disease, premenstrual syndrome.
Dosage: The dose can vary widely, with the equivalent of 270 to 540 milligrams of GLA being a common range.
Products:
- Nutricia: Efamol Evening Primrose Oil, 1,000 mg, 120 mg gamma-linolenic acid (12%), 700 mg linoleic acid per capsule, 60 softgels.
- Health from the Sun: EPO Liquid Gold, 200 mg gamma-linolenic acid per dose, 4 oz liquid.
- Jarrow: Primrose 1300, 117 mg gamma-linolenic acid per capsule, 60 softgels.

**Fenugreek**

Description: Fenugreek (*Trigonella foenum-graecum*) is an annual herb native to the Mediterranean, the Ukraine, China, and India. The part used therapeutically is the ripe, dried seed, which contains high amounts of mucilaginous fiber, proteins rich in lysine and tryptophan, and various other compounds.
Uses: Traditionally, fenugreek was used to treat anorexia, dyspepsia, gastritis, and convalescence. The German Commission E has approved it for loss of appetite. But the current interest in fenugreek is based on studies that have shown it can regulate blood sugar and lower cholesterol and triglycerides. It may be an ideal dietary supplement for diabetics, preventing elevated blood lipids and atherosclerosis, while helping to normalize blood glucose levels.
Indications: Diabetes, cholesterol problems, appetite (loss of).
Dosage: For diabetes and cholesterol control, between 5 to 30 grams with each meal can be used. The typical dosage indicated for capsules is two to three capsules with each meal. In tincture form, 3 or 4 milliliters can be taken two or three times a day.

Products:
Fenugreek Nature’s Herbs: Fenugreek, 620 mg, 100 capsules.
Fenugreek Nature’s Answer: Fenugreek Seed, 2,000 mg fenugreek seed fluid extract per 2 ml, 2 oz liquid.

Feverfew

Description: Feverfew (Tanacetum parthenium) can be found throughout North America and Europe. The leaves are used medicinally.
Uses: Feverfew is best known as a treatment for migraine headaches. Its ability to reduce the frequency, severity, and duration of migraine attacks has been confirmed by several published scientific studies. Feverfew also has general anti-inflammatory and antiplatelet aggregation activity. It is rich in substances known as sesquiterpene lactones, with parthenolide being the most common.
Indications: Migraine headaches.

Products:
Solaray: MigraGard, 350 mg feverfew, std to 0.7% (2.45 mg) parthenolide, 60 capsules.
Nature’s Answer: Feverfew Leaf Alcohol Free, 2,000 mg feverfew leaf fluid extract per 2 ml, 1 oz liquid.

Fiber

Related Items: Pectin, psyllium.
Description: Fiber, or dietary fiber, can be defined in different ways. One definition for dietary fiber is undigestible plant compounds. Another is undigestible carbohydrate.
There are two main types of fiber—insoluble fiber and soluble fiber. The best-known example of insoluble fiber is wheat bran. There are a number of types of soluble fiber—hemicelluloses, mucilages, gums, and pectins. Some well-known examples are oat bran, guar gum, and psyllium.
Uses: Certain types of fiber are thought to be more beneficial for certain conditions than other types. Soluble fiber, for example, is thought to be more effective in lowering cholesterol and modulating blood sugar levels. Insoluble fiber is thought to be more effective as a stool softener, laxative, and anti–colon cancer agent. Ongoing research, however, is leading to a blurring of these distinctions in many cases. For this reason, we are more inclined to recommend blends of various types of dietary fiber, rather than individual types.
Dietary fiber decreases intestinal transit time, reducing the amount of time toxins remain in contact with the intestinal wall. Dietary fiber slows gastric emptying time, moderating blood glucose levels. Dietary fiber, especially the soluble types, lowers serum cholesterol and triglyceride levels. The fermentation of dietary fiber by intestinal microorganisms produces short-chain fatty acids, such as butyric acid, which is a source of energy for the cells lining the colon, and may contribute to fiber’s anticancer action. Dietary fiber fills the stomach, contributing a feeling of satiety that may aid in weight loss. Dietary fiber can alleviate constipation and diarrhea and may be helpful in conditions such as irritable bowel syndrome. Dietary fiber increases stool weight, stool softness, and eases elimination, which may reduce diverticular disease and hemorrhoids.
Indications: Cholesterol problems, constipation, diarrhea, irritable bowel syndrome, weight loss, cardiovascular disease, cancer (colon), diabetes.
Dosage: Typical dosage is from 5 to 15 grams daily, before meals or at bedtime.
Cautions: If you are not accustomed to supplementing with dietary fiber, be sure to start out with small doses...
and gradually increase the amount. Always drink ample quantities of water when taking fiber supplements.

Products:
Solgar: Apple Pectin Powder, 8 oz.
Yerba Prima: Psyllium Whole Husks, 4.5 g fiber per tablespoon, 12 oz powder.
Yerba Prima: Psyllium Husk Vegicaps, 625 mg psyllium per capsule, 2.2 grams fiber per 4 vegicaps, 180 vegicaps.

**Fish Oil**

Related Items: EPA (eicosapentaenoic acid), omega-3 oils, DHA (docosahexaenoic acid).

Description: Fish oil supplements are derived from cold water fish, rich in omega-3 oils containing EPA and DHA.

Uses: EPA is a fatty acid used by the body to produce certain types of prostaglandins that have beneficial actions, such as reducing inflammation, reducing the stickiness of platelets, preventing clot formation, and dilating blood vessels. Prostaglandins are powerful, short-lived hormone-like substances produced in the body from various fatty acids. DHA is an important component of cell membranes, particularly in the brain, nervous system, and retina. Fish oil supplements contain both EPA and DHA, typically in the ratio of 1.5:1 (i.e., 180 milligrams of EPA and 120 milligrams of DHA). Other variations are available, however (see below).

Supplements of EPA and DHA are usually used to treat elevated triglyceride levels and other cardiovascular system problems, including high blood pressure, atherosclerosis, arrhythmias, and Raynaud’s disease. The anti-inflammatory action is used to alleviate the discomfort of conditions such as rheumatoid arthritis, asthma, ulcerative colitis, and Crohn’s disease. The EPA and DHA in fish oil seem to exert an immune system-modulating action as well and are recommended by some for a wide variety of problems, including eczema, psoriasis, lupus, depression, bipolar disorder, and schizophrenia. While fish oil supplements certainly may be helpful to some degree in these and similar conditions, more research is needed to verify this.

Fish oil supplements are available in several forms. The natural form usually provides 30 percent EPA and DHA. A softgel capsule containing 1,000 milligrams of fish oil would provide 300 milligrams of EPA and DHA. A 1,200-milligram softgel would contain 360 milligram of EPA and DHA. It is important when reading the label of fish oil supplements to look at the actual EPA and DHA content, rather than the total amount of oil in the capsule. This is the only way to properly compare one product to another, and is the basis on which you should determine the required dosage. If you have been told to take 2 grams of EPA/DHA per day, for example, that would mean you need about seven 1-gram capsules if the capsule was 30 percent EPA/DHA. In other words, each capsule may contain 1 gram of fish oil, but the fish oil only contains 30 percent EPA/DHA, or 300 milligrams.

The total number of capsules, therefore, can easily build up to an unwieldy level. Thus, the lure of more concentrated versions of EPA/DHA has led to the development of some natural oils that reach 50 percent EPA/DHA potency, as well as semisynthetic ethyl ester derivatives that provide as much as 85 percent EPA/DHA.

In deciding which type of product might be appropriate for you, the therapeutic value and convenience of a high-dose EPA/DHA supplement has to be weighed against the lower cost of less-concentrated products.

A product with a higher ratio of EPA might be appropriate when the intended use involves treating cardiovascular problems or inflammatory disorders such as rheumatoid arthritis. A product higher in DHA would not be appropriate under those conditions. A higher DHA-containing product would be preferable if treating problems relating to the central nervous system, attention deficit disorder, retinal problems, or cognitive impairment.

Enteric-coated fish oil supplements are available, and are especially useful when treating ulcerative colitis or Crohn’s disease. They are also less likely to result in a fishy aftertaste.

Small amounts of vitamin E are usually added to fish oil supplements to act as an antioxidant, preventing the fish oil from deteriorating during storage.

Indications: Triglycerides (high), cardiovascular disease, hypertension, arthritis (rheumatoid), Crohn’s disease,
ulcerative colitis, depression, psoriasis.

Cautions: All omega-3 oils have some antithrombotic activity. This is generally advantageous. Those already taking anticoagulant medications (Coumadin), however, should exercise caution.

Cod liver oil is a fish oil that contains some EPA and DHA. However, cod liver oil also contains substantial amounts of vitamin A and vitamin D. It is inappropriate to use cod liver oil as a source of EPA/DHA because of the danger of overdosing on vitamin A and vitamin D.

Products:
Solgar: MaxEPA, 600 mg omega-3 polyunsaturates, 360 mg EPA, 240 mg DHA per 2 capsules, 120 softgels.
Solgar: Omega-3 700, 700 mg omega-3 polyunsaturates, 360 mg EPA, 240 mg DHA, 100 mg other fatty acids per capsule, 60 softgels. Note: This is twice the potency of regular MaxEPA.
Twinlab: Super MaxEPA Capsules, 750 mg omega-3 polyunsaturates, 450 mg EPA, 300 mg DHA per 2 capsules, 100 softgels.
Twinlab: Emulsified Super MaxEPA Liquid, 1,000 mg EPA, 670 mg DHA per tablespoon (15 ml), 12 oz liquid.
Tyler: Eskimo-3 Liquid, 1,500 mg omega-3 fatty acids, 720 mg EPA, 480 mg DHA per teaspoon, 105 ml liquid. No fishy taste. Free of heavy metals and PCBs and other contaminants.
Tyler Eskimo-3 Capsules, 500 mg omega-3 fatty acids, 240 mg EPA, 160 mg DHA per 3 capsules, 105 softgels.
Carlson: Salmon Oil, 750 mg omega-3 fatty acids, 360 mg EPA, 250 mg DHA per 2 capsules, 120 softgels.
Nature’s Way: Fisol Enteric Coated, 500 mg omega-3 fatty acids, 150 mg EPA, 100 mg DHA per capsule, enteric coated, 90 softgels.
Twinlab: TwinEPA, 600 mg EPA, 240 mg DHA per capsule, 60 softgels.
European Reference Lab: Coromega, 650 mg omega-3 fatty acids, 350 mg EPA, 230 mg DHA per orange-flavored packet, 28 packets.

Flavonoids

Related Items: Quercetin, proanthocyanidins, rutin, hesperidin, bioflavonoids.

Description: In the broad sense, flavonoids is a term that covers a broad group of plant pigments. Chemically, there are several subgroups, but all have a 2-phenylchroman skeleton. There are, in fact, over 3,000 known flavonoids, and they include flavonols (quercetin), flavan-3-ols (catechin), chalcones, anthocyanidins, isoflavones (genistein), polyphenols (green tea), citrus bioflavonoids (rutin, hesperidin), and more.

The nomenclature can be confusing, because different authors group them differently.

Uses: The powerful antioxidant action of flavonoids protect the cell membranes of both the red blood cells and the cells lining the capillary walls. This prevents those cells, the endothelial cells, from become brittle and damaged. This condition, sometimes called capillary fragility, can lead to poor circulation, easy bruising, varicose veins, spider veins, and hemorrhoids. When fluid leaks from fragile capillaries, you have swelling and inflammation.

Similarly, when the cell membranes of red blood cells remain strong and elastic, they can more readily squeeze through the elastic capillary bed, carrying oxygen to the various tissues of the body.

The anthocyanoside flavonoids in plants such as bilberry, for example, probably exert their beneficial effect on the retina of the eye by this very mechanism.

Historically, flavonoids are associated with “vitamin P” activity. This was a term originally applied by Albert Szent-Gyorgyi, who discovered vitamin C, because of his observation that this group of compounds reduced capillary permeability.

We now feel that the most important biochemical, or therapeutic, action of the flavonoids as a group is their powerful antioxidant activity. Some have referred to them as “biological response modifiers,” owing to their anti-
inflammatory, antiviral, anticarcinogenic, and antiallergy properties.

Products: The products listed here are the citrus bioflavonoids. Other flavonoid supplements are listed under their respective headings.

Solgar: Citrus Bioflavonoids, 1,000 mg, 1,000 mg citrus bioflavonoid complex, 100 tablets.
Twinlab: Citrus Bioflavonoid Capsules, 1,400 mg citrus bioflavonoid complex and 100 mg rutin per 2 capsules, 100 capsules.
Nature’s Answer: Citrus Bioflavonoid Liquid with Rose Hips, 5,000 mg citrus bioflavonoids per teaspoon, 8 oz.

Flaxseed Oil

Related Item: Linseed oil.

Description: Flaxseed oil (Linum usitatissimum) differs from most other vegetable oils in that it contains very high levels of alpha linolenic acid (ALA), an omega-3 fatty acid. Flaxseed and flaxseed oil also contain lignans. Another name for flaxseed oil is linseed oil.

Uses: The average American diet is too rich in omega-6 fatty acids, and lacking in omega-3 fatty acids. Flaxseed oil is a rich source of omega-3 oils in general, and ALA specifically. ALA is unique in that it can be metabolized directly to eicosapentaenoic acid (EPA).

Supplementation with flaxseed oil is certainly going to alter the ratio of omega-3 to omega-6 oils, but it may not be as effective as EPA or fish oils as a therapeutic agent. EPA serves as a precursor in the body to beneficial prostaglandins, the powerful hormone-like agents that reduce inflammation and protect against heart disease. Not all of the ALA in flaxseed oil is converted into EPA, however. In fact, 1 gram of EPA would require about 15 to 20 grams of ALA to achieve the same effect. Converting this to actual supplement quantities, if flaxseed oil contains about 50 percent ALA and fish oil contains 18 percent EPA, that would mean one needs about four times as much flaxseed oil as fish oil to achieve the equivalent EPA-like activity. Other estimates indicate an even higher ratio. Add to this the question of whether or not the conversion from ALA to EPA becomes less efficient with age, and the value of flaxseed oil as an alternative to fish oil or EPA/DHA is less convincing.

As a general dietary source of omega-3 oils, flaxseed oil is sufficient. For those who prefer to avoid the taste of fish oil, flaxseed oil is an appropriate substitute. But for those with cardiovascular problems or arthritis, who need to achieve maximum therapeutic benefit, fish oil or similar omega-3 supplements should be used.

On the other hand, flaxseed oil may have a benefit that fish oil does not. In its natural state, flaxseed oil contains lignans. Lignans are valuable in their own right, exerting antioxidant, phytoestrogen, and antithrombotic activity. There is some evidence that the lignans in flaxseed may have anticancer activity, blocking the effects of endogenous estrogen much the same way as does soy.

Flaxseed oil is available in two forms. The clear, golden yellow oil has had the lignans and other fiber components removed, while the “high-lignan” version has a darker, muddy appearance. The former has been filtered, and the latter is the unfiltered type.

To achieve maximum therapeutic value, we suggest the high lignan, or unfiltered type of flaxseed oil whenever possible.

Indications: Cholesterol problems, triglycerides (high), arthritis.

Cautions: All omega-3 oils have some antithrombotic activity. This is generally advantageous. Those already taking anticoagulant medications (Coumadin), however, should exercise caution.

High-lignan flaxseed oil should be avoided during pregnancy or any other time when the use of phytoestrogens is contraindicated.

Flaxseed oil is easily oxidized. It must be kept under refrigeration and used in a relatively short time. The addition of antioxidants, such as vitamin E, is recommended. If the oil develops a bitter flavor, it should be discarded. Shake well before each use.
Flower Pollen

Related Item: Bee pollen.
Description: Flower pollen is an extract of pollen collected directly from plants, rather than from bees. Pollen is the male germ seed of plants. The commercial product is then processed to enhance absorption.
Uses: Studies have shown that flower pollen is effective in treating benign prostatic hyperplasia and prostatitis. There are also reports that flower pollen has liver protective activity, and that it may be of some value in preventing cancer, cardiovascular disease, and rheumatoid arthritis.
Indications: Benign prostatic hypertrophy, prostatitis.
Products:
- Graminex: Cernilton, 250 mg pollen extract from rye (Secale cereale), std. 20:1, 200 tablets.

Folic Acid

Description: Folic acid is an essential B vitamin. It is involved in a number of key biological processes, including the synthesis of DNA, RNA and proteins. It is needed for proper blood cell function and nervous cell development.
Uses: A marginal deficiency of folic acid can lead to increased risk of cardiovascular disease, certain types of cancer, Alzheimer’s disease, depression, and in pregnant women, can result in increased risk of birth defects (neural tube defects).
Folic acid is actually one of those vitamins that is absorbed better from supplements than in its natural food state.
An elevated homocysteine level is now thought to be associated with increased risk of cardiovascular disease. Folic acid is involved in controlling homocysteine levels by facilitating the conversion of homocysteine to methionine. The enzyme that metabolizes this conversion, methionine synthase, uses folic acid and vitamin B12 as cofactors.
When folic acid is used in response to elevated homocysteine levels, it is best combined with vitamin B12 and vitamin B6. Some also recommend added trimethylglycine (TMG).
A folic acid mouth rinse is thought to be of help in treating gingivitis.
Dosage: The usual dose is 400 micrograms per day, with those at risk of the indicated conditions often taking up to 800 micrograms daily.
Cautions: Vitamin B12 should be included with folic acid supplementation because folic acid can mask an underlying vitamin B12 deficiency.
Products:
- Twinlab: Folic Acid, 800 mcg, 200 capsules.
- Solgar: Folic Acid, 400 mcg, vegetarian and kosher, 250 tablets.
- Scientific Botanicals: Folirinse, 5 mg folic acid, USP per drop, 1 oz liquid. As a mouthwash/rinse, dilute 5 drops in a quarter cup warm water.

Forskolin

Related Item: Coleus forskohlii (Makandi).
Description: Coleus forskohlii is an herb native to India. It contains a substance, forskolin, that exerts hypotensive and other cell-regulating actions through the activation of an enzyme called adenylate cyclase. This enzyme regulates the amount of cyclic AMP in cells, which, in turn, activates numerous other enzymes.

Uses: There has been a great deal of interest in forskolin as a possible treatment for asthma, glaucoma, obesity, psoriasis, and various cardiovascular problems, including hypertension, congestive heart failure, and cardiomyopathy. Most of the research has been done with isolated forskolin, not the herb coleus. In addition, some of the work involved topical application, injection, and inhalation rather than oral administration. There is good reason to think that oral administration of coleus preparations standardized to 18 percent forskolin will prove effective in many of these conditions.

Dosage: The usual dose of the standardized 18 percent coleus extract is 50 milligrams, two or three times daily. A dose of 100 milligrams of a 10 percent extract would be approximately the same. Higher amounts are sometimes used.

Products:
- America’s Finest: Coleus Forskohlii, 100 mg coleus forskohlii extract (10%), providing 10 mg forskolin, 30 capsules.
- Gaia Herbs: Coleus Forskohlii Liquid, 170 mg coleus forskohlii extract (2.5%), providing 4 mg forskolin, 2 ounces.
- Enzymatic Therapy: Coleus Forskohlii, 50 mg coleus forskohlii extract (18%), providing 9 mg forskolin, 60 capsules.

FOS

Related Item: Inulin.

Description: Fructo-oligosaccharides (FOS) is a particular type of carbohydrate, composed of 3 to 5 monosaccharide units, that is resistant to human digestive enzymes. In this respect, it can be considered a type of fiber, that is, a nondigestible carbohydrate. But it can be digested, or fermented, by certain bacteria.

Uses: FOS is said to be a prebiotic, a material that may promote the growth of beneficial bacteria. In providing “food” for beneficial bacteria, FOS is thought to improve colon function and boost gastrointestinal immunity, helping perhaps to even protect against colon cancer.

When FOS is broken down by friendly bacteria, it forms short chain fatty acids, such as butyrate, which are thought to have anticancer activity.

In facilitating the growth of beneficial bacteria, FOS suppresses the growth of detrimental, or pathogenic bacteria. FOS also shares many of the advantages of dietary fiber in general.

Some have suggested that FOS can be helpful in lowering elevated cholesterol and triglyceride levels, but the quantities needed are as high, if not higher, than other forms of water-soluble fiber. So it would seem to make no sense to use FOS for this purpose when other forms of fiber (psyllium, oat bran, guar gum, etc.) are available.

Indications: Immune system, cancer (colon), irritable bowel syndrome, gastrointestinal disorders, diarrhea, constipation.

Products:
- Twinlab: Nutraflora FOS Powder, 4 oz.

Fructo-Oligosaccharides

See FOS.
Garcinia Cambogia

Related Item: Hydroxycitric acid (HCA).
Description: Garcinia cambogia is a fruit native to southeast Asia, also called Brindle berry or Malabar tamarind. It is rich in a substance called hydroxycitric acid.
Use: Extracts of garcinia cambogia have been promoted as an indication: Obesity, weight loss. In animal studies it has been shown to suppress appetite and enhance weight loss when used in conjunction with a calorie-restricted diet. It may exert this action by blocking an enzyme (ATP citrate lyase) involved with the conversion of carbohydrates to fat.
Unfortunately, clinical studies on humans have yielded mixed results. For those who are overweight, the use of garcinia cambogia in conjunction with other measures, certainly merits consideration. On the other hand, an expectation that this supplement alone is going to make fat disappear, with no additional effort on your part, is unrealistic. However, the same can be said for all weight loss supplements.
Products:
- Natrol: Citrimax Capsules, 250 mg hydroxycitric acid from the rind of garcinia cambogia fruit, 90 capsules.
- Twinlab: Mega Citrimax, 750 mg garcinia cambogia rind extract, 100 mcg chromium picolinate, 100 capsules.

Garlic

Description: Garlic (Allium sativum) is an herb that has been used as a medicinal agent and food seasoning for many centuries. In fact, its medicinal use may predate its food use. Almost all commercially available garlic is cultivated, not wild.
Uses: Describing the medicinal uses of garlic is easy. It has been shown to exert vasodilation and diuretic properties, making it useful to those with high blood pressure and congestive heart failure. It has been shown to contain components that reduce blood clotting, making it useful to those with thrombotic types of heart disease. It has been shown to lower cholesterol levels. And it has demonstrated varying degrees of germicidal activity, antioxidant action, and immune system stimulation.
Describing the best form of supplemental garlic, on the other hand, is not so easy. There are over 1,900 scientific studies published on the activities of garlic, and these studies have utilized all the various forms—fresh, powdered, oil, aged, etc. In most cases, all forms seem to work well. But fueled by the various marketing arms of the companies selling garlic supplements, controversy of which type of supplements is best rages on.
The difference between the forms is related primarily to the presence, or absence, of one component in fresh garlic—allicin. Garlic contains about 1 percent alliin. When alliin is activated, in the presence of the enzyme alliinase, it converts to allicin. Allicin, a thiosulfinate, is thought to be responsible for most of the beneficial actions of garlic. Unfortunately, the allicin content is what gives garlic its characteristic odor.
Aged, or deodorized garlic, may not provide as much allicin (or allicin potential) as other forms of garlic, but it may be more socially acceptable. The best-known brand of aged garlic is Kyolic. Other methods of avoiding the odor involve enteric coating the product, which will prevent the release of allicin in the upper part of the digestive tract. This is the principle utilized by Kwai. Other companies focus on allicin content, or allicin-potential, and produce supplements with as high a level of allicin as possible.
Which is best? An easy answer would be to say they are all good, and the best one for you is the one you tolerate best. This would actually not be a bad answer, for as stated above, there is research supporting the efficacy of all forms of garlic supplements. If there is any difference, it might be that the aged form (Kyolic) seems to be better documented for its anticancer action, while higher allicin-containing products may be preferable for those with cardiovascular, immune, and microbial problems.
It is our recommendation, then, that in general, a standardized garlic preparation is preferable to a nonstandardized, with a reasonably high alliin content. Alliin itself will not cause odor, but on enzymatic hydrolysis, will release allicin. But personal tolerances have to be taken into account, and in the case of garlic supplements, some degree of experimentation may be necessary.

While allicin content, or potential, is an easy marker to be used in standardization, it should be pointed out again that allicin may not be the only active ingredient in garlic. Both aged and cooked garlic, as well as distilled garlic oil, have low allicin content but show clinical activity.

Indications: Cancer, cardiovascular disease, cholesterol problems, hypertension, immune system, parasites, stroke, triglycerides (high).

Dosage: Ten milligrams of alliin is equivalent, potentially, to 4,000 micrograms of allicin. This is said to be equivalent to one clove (4 grams) of fresh garlic, and is the recommended dose unless advised otherwise.

Products:
- Kwai: Kwai Garlic, “Unique Coating,” 4 tablets provide 600 mg concentrated garlic powder, 120 tablets.
- Kyolic: Kyolic Reserve, 600 mg aged garlic extract, 120 capsules. Enzymatic Therapy: Garlinase, 4,000, enteric-coated, 320 mg, yielding 5,000 mcg allicin, 30 tablets.
- Natrol: Garlipure, Once Daily Potency, enteric-coated, 600 mg, yielding 6,000 mcg allicin, 30 tablets.
- Solgar: MaxGar Garlic, 280 mg, garlic oil macerate (2.4:1 concentrate), odor controlled, 180 softgels.

Genistein

Description: Genistein is the isoflavone-type of flavonoid found in soybeans. It is categorized as a phytoestrogen, a plant-derived non-steroidal compound that exhibits estrogen-like biological activity. Genistein occurs naturally in soy as genistin, a glycoside.

Uses: Genistein can be thought of as having both weak estrogenic and weak anti-estrogenic action. It is an antioxidant, and may have anticarcinogenic, anti-osteoporotic, and anti-atherogenic activity.

Dosage: Owing to the wide variety of products, generalization is difficult. Read the product label. For example, 125 milligrams of soy isoflavone concentrate may contain about 50 milligrams of soy isoflavones, and 25 milligrams of that might be genistin.

Indications: Benign prostatic hypertrophy, cancer (breast), cancer (prostate), cholesterol problems, menopause.

Products:
- Twinlab: Mega Soy, 200 mg soy bean extract (40% isoflavones, 80 mg), providing 40 mg genistin, 31 mg diadzin, and 8 mg glycetin, 60 capsules.
- Jarrow: Isoflavone 50, 50 mg isoflavonoid complex providing 25 mg genistein, 18 mg diadzein, and 7 mg glycetin, 60 capsules.
- Solgar: Super Concentrated Isoflavones, 38 mg total isoflavones from soy isoflavone extract, 120 tablets.

Germanium

Description: Germanium is a mineral found in the earth’s crust. It is present in grains, vegetables, and seeds. It is not considered an essential nutrient for humans.

Uses: Germanium has been claimed to exert anticancer and antioxidant activity. It can be highly toxic, under certain circumstances, and is not recommended for general supplement use. The form used in supplements is known as Ge-132, germanium-132, germanium sesquioxide, or bis-carboxyethyl germanium sesquioxide.

Cautions: We recommend avoiding germanium supplementation unless done under the guidance or direction of
Ginger

Description: Ginger (Zingiber officinale) is a large root (rhizome, actually) native to southern Asia, but now cultivated in almost all tropical areas. It has been used as a medicine since ancient times.

Uses: Ginger has been used for thousands of years to treat stomach, diarrhea, nausea, and other gastrointestinal disorders. Considerable attention in recent years has focused on its effectiveness in treating morning sickness, motion sickness, and other types of nausea.

Ginger may also be of some value to those with cardiovascular and inflammatory problems. As is the case with many herbs (ginkgo, feverfew, garlic, turmeric), ginger inhibits PAF (platelet-activating factor), which is involved in blood clotting and inflammation.

Ginger is considered a gastrointestinal tonic, protecting the stomach lining from damage. Most recently, Ginger’s powerful antioxidant and anti-inflammatory action has been linked to its ability to inhibit COX-2, just as NSAIDs do, without their serious side effects.

Indications: Gastrointestinal disorders, motion sickness, nausea, arthritis.

Cautions: The Commission E contraindicates ginger usage for morning sickness during pregnancy. According to most other experts, however, there is no basis for this. Also, ginger has been widely used for morning sickness in other cultures (Chinese medicine) for quite some time.

Products:
- Nature’s Answer: Ginger Root Fluid Extract, 1,000 mg of ginger root per 28 drops, 2 fl oz.
- Enzymatic Therapy: Gingerall, ginger 100 mg, 20% pungent compounds, as 6-gingerol and 6-shogaol, 90 softgels.
- New Chapter: Gingerforce, 150 mg, ginger, super critical extract, 30% pungent compounds, 8% zingiberene, 60 capsules.
- Nature’s Herbs: Ginger Root, ginger from India, 100 capsules.

Ginkgo Biloba

Description: Ginkgo is the world’s most ancient tree. The dry extract from the ginkgo leaf is a 50:1 extract, with 22 to 27 percent flavonone glycosides (quercetin, kaempferol), 5 to 7 percent terpene lactones (ginkgolides A, B, and C, bilobalide), and less than 5 parts per milligram ginkgolic acid.

Uses: There have been over 400 scientific studies on standardized ginkgo extract over the past thirty years. Ginkgo biloba has been shown to enhance cerebral and peripheral circulation. It has been used to prevent or treat Alzheimer’s disease and other types of age-related cognitive decline, memory problems, intermittent claudication, vertigo, tinnitus, erectile dysfunction, peripheral arterial occlusive disease, and altitude sickness.

The impressive body of research supporting these uses of ginkgo is not limited to foreign medical journals. A placebo-controlled, double-blind, randomized, multicenter trial on ginkgo’s effect on Alzheimer’s disease was published in the Journal of the American Medical Association in 1997. The ginkgo group showed either improvement or a delay in the progression of the disease.

Clearly, ginkgo biloba is an herb that should be part of the supplement program for anyone with impaired cerebral or peripheral circulatory function.

Dosage: The usual dose is 120 to 240 milligrams of standardized extract per day, in divided doses.

Indications: Alzheimer’s disease, age-related cognitive decline, intermittent claudication, depression, macular
degeneration, erectile dysfunction, vertigo, tinnitus, asthma, retinopathy.

Cautions: This item has a slight “thinning” effect on the blood. This, generally, is a good thing. But if you are taking blood-thinning medications, check with your doctor.

Products:
Nature’s Way: Ginkgold, 60 mg, 60 mg ginkgo leaf std. (24% ginkgo flavone glycosides and 6% terpene lactones) extract, providing 20 active and co-active compounds, 100 tablets.
Natrol: Ginkgo Biloba Extract, 60 mg std. ginkgo leaf extract per dropper, 2 oz liquid.
Solgar: Super Ginkgo, 60 mg ginkgo biloba leaf extract (50:1), std to 24% (14 mg ginkgoflavoglycosides), and 375 mg ginkgo leaf powder, 100 vegicaps.

Ginseng

Related Items: Siberian ginseng, American ginseng.
Description: Ginseng is a slow-growing perennial herb native to northeastern China, Korea, and part of Russia. The main active ingredient is ginsenosides.

There are several types of ginseng. Asian, or Korean, ginseng (Panax ginseng) is available in a red (steamed and cured) form as well as the regular white (unprocessed) form. The red form is considered more stimulating. And American ginseng (Panax quinquefolius) is considered less stimulating, or “yang,” than Asian ginseng.

Uses: A summary of the numerous studies on ginseng is far beyond the scope of this book. An explanation of the various nuances of using one type of ginseng over another and its role in traditional Chinese medicinal philosophy is also inappropriate.

Instead, suffice it to say that ginseng has retained a reputation as one of the premier general tonic herbs for over 5,000 years. In Asian medicine, it is used as a tonic to revitalize and replenish vital energy. This does not mean you should expect the type of energy jolt you get from a dose of caffeine. The effect is more subtle. It is a tonic that revitalizes the function of the organism as a whole, building resistance, reducing susceptibility to illness, and promoting health and longevity.

Commission E approves ginseng as a tonic for invigoration and fortification in times of fatigue and debility or declining capacity for work and concentration.

Indications: Immune system, athletic performance, energy (low), antiaging, cold and flu, erectile dysfunction, fertility (male), chronic fatigue syndrome, cancer, diabetes.

Dosage: Standardized extracts: 200 to 500 milligrams per day. The dose for nonstandardized concentrates is higher. For liquid tinctures, follow the directions on the label, or use 2 to 3 milliliters three times a day.

Cautions: Asian and American ginseng may be contraindicated in those with hypertension.

Products:
Nature’s Way: Korean Ginseng Root, 510 mg Panax ginseng (2% ginsenosides) per capsule, 100 capsules.
Solgar: Korean Ginseng Root Extract, 250 mg Panax ginseng root extract (8% ginsenosides, 20 mg), 200 mg panax ginseng powder, 60 vegicaps.
Nature’s Way: Korean Ginseng Extract, 535 mg Panax ginseng root extract (7% ginsenosides), 50 mg Panax ginseng root powder, 60 capsules.
Root to Health: American ginseng, 500 mg Panax quinquefolius per capsule, 100 capsules.
Solgar: American Ginseng Extract, 100 mg Panax quinquefolius root extract (10% ginsenosides), 200 mg Panax quinquefolius powder (5% ginsenosides), 15 mg ginsenosides total, 60 vegicaps.
Nature’s Answer: Ginseng, American, Root, 2,000 mg American ginseng root fluid extract per 2 ml (75 mg total ginsenosides), 1 oz liquid.
Nature’s Answer: Ginseng, Chinese White, Root Alcohol Free, 1,000 mg White Chinese ginseng root (75 mg total ginsenosides) per ml, 1 oz. liquid.
Prince of Peace: Panax Ginseng Extractum, 2,000 mg Red Panax ginseng root extract (3:1) per vial, 30

**Glucosamine**

Related Items: Cartilage, chondroitin.

Description: Glucosamine is the building block from which the body makes cartilage, collagen, and all the other components of connective tissue. Specifically, it is an amino sugar, and is involved in the synthesis of proteoglycans such as chondroitin.

Usage: Glucosamine is used to repair damaged joints, reduce inflammation, enhance wound healing, induce the regeneration of connective tissue, and maintain the proper viscosity of synovial fluid, to cushion the joint area.

Glucosamine is available in several forms—glucosamine sulfate, glucosamine hydrochloride, and N-acetyl-glucosamine.

The glucosamine sulfate form is the one most widely studied, and may be the preferred form. One problem is that it needs to be stabilized by the inclusion of sodium chloride or potassium chloride. The sodium chloride form is the type most often used in the research studies, but because some people are concerned about their total daily intake of salt, the potassium chloride form is available as well.

The glucosamine hydrochloride form does not need to be stabilized, and can provide more actual glucosamine per unit dose. Most of the research, however, has been done on the sulfate form of glucosamine.

Some claim that another reason the sulfate form of glucosamine may be preferred is that the sulfate itself is used as part of the tissue-regenerating process. But when absorbed, the sulfate is split from the glucosamine molecule, and there is no evidence that the sulfur necessary for its subsequent action cannot be obtained from existing cellular stores.

The fact that the sulfate form was the form most often used in the published research does not necessarily mean that that form is the best. It does mean, however, that the sulfate form is known to work.

Likewise, the fact that a researcher reported positive results when using a combination of glucosamine and chondroitin does not mean that glucosamine alone, or chondroitin alone, would not work even better. The book popularizing the use of the combination did not do a comparison between the combination and the individual components.

Combination products sometimes seem to work better, but this may be because the total amount of chondroitin and glucosamine in those combinations is greater than the amount usually taken individually.

Indications: Arthritis, sports injuries.

Products:
- Enzymatic Therapy: GS-500, 150 mg of sodium in three capsules, 120 capsules.
- Jarrow: Glucosamine Sulfate, 1,000, Sodium-free. Stabilized with potassium chloride.
- Twinlab: Glucosamine Sulfate, 750 mg, 100 tablets. 90 capsules sodium-free. Stabilized with potassium chloride.

**Glutamine**

Description: L-glutamine is an amino acid. It is not categorized as “essential” because it can be made in the body in sufficient amounts under normal health conditions. When the body is under stress (trauma, cancer, infections, burns, healing), the value of L-glutamine increases, and the quantity needed may increase as well.

Uses: L-glutamine serves many roles in the body. It helps regulate the acid-base equilibrium of the body. It provides nitrogen to various tissues of the body, and is involved in protein synthesis and carbohydrate metabolism. L-glutamine is involved in energy production, and supports immune system function. It can serve as a source of glucose when necessary, and is involved in the synthesis of glutathione, one of the body’s most important antioxidants. L-glutamine is thought to be helpful in treating various infections and disorders of the gastrointestinal tract,
perhaps owing to its seeming ability to decrease intestinal permeability and mucosal atrophy in the small intestine.

For these reasons, L-glutamine is considered an important dietary supplement when the body has been exposed to various types of trauma and stress.

Indications: Nutritional support, healing, immune system, gastrointestinal disorders, athletic performance.

Products:
- Solgar: Glutamine, 500 mg vegetarian and kosher, 250 vegicaps.
- Jarrow: Glutamine Powder, 8 oz.
- Twinlab: Glutamine, 1,000 mg, 50 tablets.

Glutathione

Related Items: GSH, cysteine, NAC (N-acetyl cysteine).

Description: Glutathione is a tripeptide, a small protein composed of the amino acids cysteine, glutamic acid, and glycine. It can occur in two forms, a monomer (commonly referred to as reduced glutathione or GSH) and a dimer (commonly referred to as oxidized glutathione, or glutathione disulfide). The reduced form, or GSH, is the type that is used in nutritional supplements.

Uses: Glutathione is a powerful antioxidant. It exerts this antioxidant function in several ways, as a cofactor in various enzyme systems and helping maintain and regenerate other antioxidant nutrients. It appears to play an important role in the body as a detoxifier and immune system modulator.

One problem with glutathione as a supplement is that it may not be absorbed well when taken orally. This casts some doubt on the advisability of taking glutathione in supplement form. Instead, taking supplements of glutathione precursors such as N-acetyl-cysteine, cysteine, and methionine may be a more efficient way of increasing glutathione levels in the body. Studies have shown that other nutrients, such as vitamin C, alpha-lipoic acid, SAMe, and whey protein result in increased glutathione levels. Selenium, vitamin B6, and riboflavin are involved in optimal glutathione function as well.

Indications: Cancer, cataracts, detoxification, diabetes, lung (pulmonary) disease, HIV, Parkinson’s disease, infertility (men).

Products:
- Twinlab: Mega Glutathione, 250 mg, reduced glutathione, 60 capsules.
- Jarrow: Reduced Glutathione 500, Pharmaceutical grade, 60 capsules.
- Solgar: L-Glutathione, 250 mg, vegetarian and kosher, 60 vegicaps.
- Tyler: Recancostat 100, 200 mg L-glutathione, reduced, 100 mg, “AnthoRedoxin Blend,” 40 mg L-cysteine, 90 capsules.
- “AnthoRedoxin Blend” has been shown to recycle glutathione from the oxidized to the reduced form.
- Jarrow: ThioNac, 500 mg NAC, 100 mg lipoic acid, 60 tablets. Glutathione precursors.
- Allergy Research: Thiodox, 250 mg NAC, 150 mg lipoic acid, 200 mg glutathione, plus selenium, riboflavin, vitamin C, and thiamine, 60 tablets. Glutathione and precursors.

Goldenseal

Related Item: Berberine.

Description: Goldenseal (Hydrastis canadensis) is a plant that is native to eastern North America. It contains small amounts of the alkaloids berberine and hydrastine.

Uses: Goldenseal has a reputation as a powerful antibiotic, a treatment for the common cold, and an ability to mask the presence of illicit drugs in the urine. Unfortunately, this reputation remains, even though evidence supporting it is lacking.
There is little to be gained in using a combination of echinacea and goldenseal, for example, rather than echinacea alone for treating a cold.

Goldenseal seems to exert its anti-infective and healing action best when used topically, for example, as a mouthwash (for canker sores), a gargle (for sore throat), or an eyewash (for conjunctivitis or blepharitis). It also appears to work when taken internally for gastrointestinal problems, including bacterial parasites. In situations where there is either increased mucous production, or not enough, goldenseal is thought to exert a corrective or “alterative” action.

Indications: Canker sores, gastrointestinal disorders, parasites.

Products:
- Nature’s Way: Goldenseal Root, 570 mg goldenseal root providing 5% total alkaloids, 100 capsules.
- Nature’s Answer: Goldenseal Root Drops, 500 mg goldenseal in 28 drops, 1 oz liquid.

Grape Seed Extract

Related Items: PCO, OPC, Pycnogenol.

Description: Grape seed extract is a rich source of a certain type of plant flavonoids, the proanthocyanidins. Proanthocyanidin is a term used to define a certain group of flavonoid composed mostly of catechin and epicatechin. When catechin, epicatechin, and in the case of grape seed, gallic acid esters form complexes, or oligomers, you have proanthocyanidins, or procyanidins. These procyanidin polymers are also known as OPCs, which stands for oligomeric procyanidins or PCOs, which stands for procyanidolic oligomers. While it is not necessary for you to understand the chemistry behind this nomenclature, it is important because products are labeled in terms of their PCO or OPC content.

Uses: The type of flavonoids present in grape seed extract are thought to function as powerful antioxidants, protecting tissues, glands, and organs throughout the body from the deleterious effects of free radical damage. In addition, these flavonoids have an ability to strengthen collagen. This explains its value in enhancing the integrity of skin, blood vessels, and connective tissue. It exerts an anti-inflammatory action, perhaps by inhibiting the release of pro-inflammatory prostaglandins. There is also compelling evidence that the proanthocyanidins in grape seed have anticarcinogenic activity.

Products containing PCO or OPC flavonoids are considered by many to be some of the most valuable and inclusive antioxidants available, and should be part of any comprehensive supplement programs.

Note: There are two types of supplements available that are rich in OPCs. One is grape seed extract, and the other is a trademarked product called Pycnogenol, which is derived from pine bark. There have been claims and counterclaims as to which is better. Much of this was a result of the initial multilevel marketing involvement with Pycnogenol. Marketing hyperbole to the contrary, they are similar in composition and function. Grape seed extract contains between 92 and 95 percent PCO while the Pycnogenol products contain only 80 to 85 percent PCO. Considerable research has been performed on the grape seed extract, and in Europe, it is the more popular of the two supplements. Finally, the grape seed extract is often less expensive.

Indications: Vision problems, anti-aging, arthritis, cancer, allergies, cardiovascular disease, cataracts, macular degeneration, night blindness, retinopathy, sports injuries, vision problems, hemorrhoids, varicose veins, chronic venous insufficiency.

Products:
- Seagate Gold: Grape Seed Extract, 250 mg, 150 mg red grape seed extract, 100 mg red grape skin extract, 90 capsules. Note that this product contains not only an extract of the grape seed, but also an extract of grape skin. (See “Resveratrol.”)
- Jarrow: OPCs+95, 100 mg grape seed extract (100:1), 95% polyphenols, 100 capsules.

THE PHARMACIST SAYS: And as Larry Siegel, the chief pharmacist at Willner Chemists, likes to point
Grapefruit Seed Extract

Description: Grapefruit seed extract is a natural antiseptic.
Uses: This material is caustic and potentially irritating to the skin and mucous membranes. Although when properly diluted, it has been recommended as an antifungal or antibacterial for sinus, vaginal, and topical infections, the desirability of such applications is questionable. There is some speculation that its antimicrobial activity is due more to the inclusion of certain other nonnatural preservatives than the GSE itself.
The only justifiable internal use, when properly diluted, is as a treatment for certain chronic intestinal infections. The liquid has been used as a fruit and vegetable wash.
Do not confuse grapefruit seed extract with grape seed extract.
Cautions: This product should be used only under the guidance of a health professional. Be sure to wash your hands after use, and avoid getting it near your eyes.
Products:
Allergy Research: Paramicrocidin, 250 mg, citrus seed extract, 250 capsules.
Nutribiotic: Grapefruit Seed Concentrate.

Green Foods

Related Items: Spirulina, chlorella, wheat grass, barley grass, chlorophyll, blue green algae
Description: All green-food supplements are relatively rich in protein, chlorophyll, and carotenoids. Marketing claims to the contrary, there is little documented therapeutic difference among them.
Uses: Green-food concentrates of this type are claimed to have anticancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents.
While convincing proof of all these actions may be lacking, there is certainly no reason not to include one of the green-food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antioxidants, and varying amounts of trace nutrients. The problem with these supplements is that exaggerated marketing claims often accompany the products, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.
Indications: Nutritional support, detoxification, immune system, cancer.
Cautions: Green-food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.
Products:
Green Foods: Veggie Magma, mixture of 13 dried juices including barley, carrot, alfalfa, tomato, kale, broccoli, and 7 others. 9 oz powder.
Gary Null: Green Stuff Powder. “Green Mix” containing 8 juices including kamut, barley green, wheat grass, and alfalfa, 200 g.

Green Tea Extract

Related Item: Theanine.
Description: Green tea (Camellia sinensis) and black tea are derived from the same plant, but green tea is less extensively processed. To prepare black tea, the leaves are allowed to oxidize. During this “aging” process, some of the beneficial components, such as the polyphenols, are enzymatically converted to ingredients with less therapeutic value. Green tea is especially high in the particular type of polyphenol flavonoids known as catechins. Unique to green tea is the high level of one
catechin in particular, EGCG, or epigallocatechin gallate. The predominant amino acid found in green tea is L-theanine. See Theanine for more information.

Use: Green tea has powerful antioxidant and anticancer properties. High consumption of green tea in Japan is thought to be one of the main reasons for their low cancer rate. The EGCG in green tea appears to be the component responsible for its anticancer activity. It seems to exert this anticarcinogenic action through a variety of different mechanisms, and it is still a matter of intense, ongoing research.

The antioxidant properties of green tea catechins may explain its anti-inflammatory and anti-atherosclerosis action. There is also some evidence that green tea extract is an effective thermogenic agent, and may therefore be helpful in weight loss.

For those concerned about reducing their risk of cancers of almost any type, taking green tea extract and drinking green tea seems prudent and reasonable.

Indications: Cancer, prostate cancer, arthritis, cardiovascular disease, obesity, weight loss.

Dosage: The amount of polyphenols, or EGCG, necessary for therapeutic benefit is thought to range from 250 to 750 milligrams per day.

Note: While green tea may theoretically be richer in certain of the components thought to be cancer-protective, research has shown that black tea is not without benefit in this regard as well.

Cautions: Green tea contains less caffeine than black tea, and most research now indicates that small amounts of caffeine are benign. But decaffeinated products are available for those who wish to avoid even small amounts of caffeine.

Products:
- Nature’s Herbs: Green Tea Power, Caffeine Free, 383 mg green tea extract (20% polyphenols, 75 mg), 75 mg grapeskin extract (18% polyphenols), 60 capsules.
- Solgar: Green Tea Leaf Extract, 400 mg green tea extract (50% polyphenols, 200 mg), 100 mg green tea leaf powder, 60 vegicaps. Jarrow: Green Tea 5:1 Powder, 50% polyphenols, 33% catechins, 16.5% EGCG, 100 g.

**Green-Lipped Mussel Extract**

Related Items: Cartilage, shark cartilage, bovine cartilage.

Description: Cartilage is the gristle or connective tissue attached to the ends of bones. It is a component of joints, and helps cushion and support the bones. In general terms, cartilage is composed of collagen and proteoglycans, which in turn contain glycosaminoglycans (GAGs) or mucopolysaccharides, which in turn contain chondroitin sulfate, which in turn contains glucosamine. There is considerable argument and debate in the nutritional-supplement industry over which of the forms of cartilage—shark cartilage, bovine cartilage, glucosamine sulfate, chondroitin sulfate, or another mucopolysaccharide-rich substance such as green-lipped mussel extract or sea cucumber—is most effective. There is no clear answer, as there is some degree of support for each argument, and there is clinical evidence supporting the efficacy of each supplement.

Uses: A source of mucopolysaccharides, from the New Zealand green-lipped mussel, which has been shown in at least one study to help reduce the inflammation and joint damage in arthritis.

Indications: Arthritis.

Products:
- Da Vinci: Perna, 1,000 mg Perna canaliculus (green-lipped mussel), 200 mg alfalfa leaf, 2 mg cinnamon oil, 180 capsules.

**GSH**

See Glutathione.
Guarana

Description: Guarana is a plant indigenous to the Amazon basin. It contains caffeine and related alkaloids.
Uses: Guarana is used as a source of caffeine, as a stimulant, or in combination with ephedra as a thermogenic agent.
Cautions: Guarana has been a major ingredient in many weight loss products over the years. Many of the people taking these products were not aware that the primary use of guarana in these products is as a source of caffeine.
Products:
   Natrol: Guarana Capsules, 200 mg guarana seed extract (4:1), 90 capsules.

Guggul

Description: Guggul (Commiphora mukul) is the gum resin of the Indian myrrh tree. The resin contains guggulsterones, which are thought to be responsible for its hypolipidemic effects, that is, they lower blood lipids.
Uses: Gum guggul has long been used in Ayurvedic (Indian) medicine for its usefulness in treating obesity and inflammation. Current interest in gum guggul, however, is related to its ability to lower cholesterol, triglycerides, and LDL cholesterol, while raising HDL cholesterol.
Crude powdered guggul contains between 0.5 and 1 percent guggulsterones. A purified powder contains between 2 and 5 percent guggulsterones, but an extract of gum guggul, called gugulipid, contains 5 percent guggulsterones and is the form most often used in research.
Indications: Cholesterol problems.
Products:
   Doctor’s Best: Ultra Guggulow, 1,000 mg gum guggul ext (resin), providing 2.5% (25 mg) guggulsterones, and 5 mg black pepper ext, 90 tablets.
   Nature’s Herbs: Gugulmax, 50 tablets.

Gymnema Sylvestre

Description: Gymnema is a plant that is native to the tropical forest of central and southern India.
Uses: Gymnema has been shown to improve blood sugar control in diabetes. It seems to work in both Type I and Type II diabetes, apparently by enhancing the production of endogenous insulin.
Several studies have shown that Type II diabetics are able to reduce or discontinue their oral hypoglycemic medications, and Type I diabetics on insulin therapy can reduce their insulin requirements.
Indications: Diabetes.
Dosage: The usual dose is 400 milligrams daily.
Products:
   Nature’s Herbs: Gymnesyl Ayurvedic, 250 mg gymnema leaf ext (75% gymnemic acid) and 280 mg gymnema leaf, 50 capsules.
   Natrol: Gymnema Sylvestre with Pullulan, 300 mg gymnema leaf ext (5:1, 25% gymnemic acid) and 150 mg pullulan, 90 capsules.

Hawthorn

Description: Hawthorn (Crataegus oxyacantha) is a spiny shrub that is native to Europe. The leaves, berries, and flowers are very rich in flavonoids, including the proanthocyanidins, quercetin, catechin, and epicatechin.
Uses: Hawthorn has long been used as a heart tonic. Specifically, it is thought to be valuable in treating congestive
heart failure, angina, and high blood pressure. Hawthorn strengthens heart muscle (an inotropic agent), dilates the coronary vessels, and seems to prevent cholesterol from forming deposits in the arterial walls. It is thought that the proanthocyanidins in Hawthorn actually have an ACE-inhibiting action.

Indications: Cardiovascular disease, hypertension, cholesterol problems.

Dosage: 100 to 300 milligrams of standardized extract, three times a day.

Products:
- Nature’s Way: Heart Care, 80 mg hawthorn leaf and flower extract (18.75% oligomeric procyanidins), 120 tablets.
- Nature’s Answer: Hawthorn Berries, 2,000 mg hawthorn berry, leaf and flower fluid extract per 2 ml, 2 oz liquid.
- Solgar: Hawthorn Berry Extract, 150 mg hawthorn leaf and flower extract (1.8%, 3 mg vitexin), 250 mg hawthorn berry powder, 60 vegicaps.

**HCA**

See Garcinia Cambogia.

**Hemp Oil**

Related Item: Flaxseed Oil.

Description: Hemp seed oil is derived from the seed of Cannabis sativa. It is rich in ALA (alpha-linolenic acid) and also contains small amounts of GLA (gamma-linolenic acid).

Uses: Hemp seed oil, because it is rich in ALA and GLA fatty acids, may serve as an alternative to flaxseed oil. (See Flaxseed Oil for more information.) These two types of fatty acids serve as precursors to prostaglandins with beneficial actions such as reduction of inflammation, inhibition of platelet aggregation, vasodilation, etc. Hemp seed oil may eventually be shown to exert the same benefits as flaxseed oil and other omega-3 rich oils, but the research has not yet been published. There is also the concern that small amounts of tetrahydrocannabinol and similar psychoactive substances may be present. For the moment, there seems little reason to use hemp seed oil rather than other omega-3-containing oils such as flaxseed, fish oil, black currant oil, etc.

Products: The availability of hemp oil products is currently restricted due to an ongoing debate with the FDA as to their legal status.

**Hesperidin**

Related Items: Flavonoids, citrus bioflavonoids.

Description: Hesperidin is a flavonoid, often a component of the “citrus bioflavonoid” type of supplement. On hydrolysis, hesperidin yields hesperetin (methyl eriodictyol), rhamnose, and glucose.

Uses: Hesperidin is an antioxidant, as are most flavonoids. It exerts anti-inflammatory, anti-allergic, vasoprotective and lipid-lowering action. There is also interest in hesperidin as an anticancer agent, based on numerous animal and laboratory studies. Of the various flavonoids, hesperidin and catechin (see OPCs) seemed to be the most powerful.

Hesperidin’s antioxidant and vasoprotective actions are well recognized. Less well appreciated, however, is the fact that hesperidin seems to be effective in raising HDL cholesterol, while lowering total cholesterol and triglyceride levels.

Indications: Cardiovascular disease, varicose veins, hemorrhoids, cholesterol problems, allergies.

Products:
- Thorne Research: HMC Hesperidin, 250 mg hesperidin methyl chalcone, 60 capsules.
HMB

Description: (beta-hydroxy beta-methylbutyrate) (HMB) is a metabolite of the amino acid leucine. Leucine is an essential amino acid. Amino acids function as the building blocks of protein. HMB is claimed to enhance the synthesis of muscle protein and to inhibit the breakdown of muscle tissue that occurs during and immediately after weight training. Human research in support of this is inconclusive. Some studies do suggest greater muscle gain when supplementing with HMB, while others do not.

Indications: Athletic performance.

Dosage: The usual dose seems to be 3 grams daily, in conjunction with weight training.

Products:
- EAS Labs: HMB, 250 mg HMB per capsule, 120 capsules.
- Twinlab: Mega HMB Fuel, 750 mg, 750 mg HMB per capsule, 60 capsules. Note that the Twinlab product has a much higher HMB content.

Horse Chestnut

Description: Horse chestnut (Aesculus hippocastanum) seed extract is derived from a deciduous tree native to the central Balkan peninsula. The seed contains 3 to 6 percent of a mixture of triterpene saponins referred to as escin. The dry extract, used in supplements, should contain 16 to 20 percent escin (aescin).

Uses: In Germany, the consensus among physicians is that horse chestnut is an effective treatment for varicose veins, chronic venous insufficiency, and related vascular disorders. A survey of 800 German physicians concluded that horse chestnut seed extract improved or resolved symptoms (pain, tiredness, tension and swelling in the legs, itching, edema, etc) of chronic venous insufficiency.

Chronic venus insufficiency is the term used to describe what happens when veins become chronically swollen and inflamed. It results in an aching, tired feeling in the legs. There may be pain, itching, leg ulcers, and changes in skin pigmentation. It is commonly associated with varicose veins. The standard treatment for CVI (chronic venous insufficiency) is compression using bandages or support stockings, drugs, or surgery. Compliance is typically poor. Compliance when using herbal therapies such as horse chestnut and butcher’s broom is significantly improved.

Indications: Chronic venous insufficiency, varicose veins, hemorrhoids, leg cramps.

Dosage: The usual dose is around 300 milligrams (corresponding to about 50 milligrams escin, or aescin), taken twice a day.

Products:
- Pharmaton: Venastat Sustained Release, 300 mg sustained release horse chestnut seed extract (HCE50), as triterpene glycosides calculated as escin (16%), 60 capsules.
- Nature’s Herbs: Veno Care, 257 mg horse chestnut seed extract (18.22% triterpene glycosides) with ginger, rutin, and butcher’s broom, 60 capsules.
- Nature’s Answer: Horse Chestnut Seed Extract, 250 mg horse chestnut seed extract (20% B-aescin), 90 vegicaps.

Horsetail

Related Item: Silicon.

Description: Horsetail (Equisetum arvense) is a plant found throughout the northern temperate regions of Asia, Europe, and North America. It is also known as bottlebrush and shave grass.

Uses: Horsetail is rich in silicon and flavonoids. It is used traditionally as a treatment for various genitourinary
tract problems—infec tions and inflammations. It has mild diuretic properties. More recently, horsetail is of interest because of its purported value in strengthening hair and nails, and perhaps bone.

Indications: Urinary tract infections, hair, skin, and nails.

Products:
Nature’s Herbs: Silica Power, 300 mg horsetail (aerial part) extract, standardized to 10% silicic acid, equivalent to 7.7% silica, 150 mg horsetail (aerial part) powder, 60 capsules.
Alta Health: Alta Silica, 500 mg horsetail herb extract, Pure ortho form of soluble/colloidal silica, 120 tablets.

Huperzine A

Description: Huperzine A is a plant alkaloid derived from a type of moss that grows in China called huperzia. Use: Huperzine A seems to be as effective in treating Alzheimer’s disease and age-related cognitive decline and memory loss as certain prescription medications. It functions as an inhibitor of the enzyme acetylcholinesterase. Acetylcholine is the primary neurotransmitter in the brain. Acetylcholinesterase is the enzyme that breaks down this neurotransmitter. When huperzine A, or drugs such as Donepezil or Tacrine, inhibit this enzyme, the net result is higher levels of acetylcholine, and enhanced brain function.

There seems to be little question that huperzine A works. In fact, it works so well that it has to be used with caution. (See below.)

Indications: Alzheimer’s disease, anti-aging, mental function.

Dosage: 50 to 200 micrograms, two or three times a day.

Cautions: If you are taking medication, huperzine A should be used only with your doctor’s approval. If used with other acetylcholinesterase inhibitors, the effect could be additive. The same could prove true if used with cholinergic drugs, or choline-boosting nutritional supplements (i.e., phosphatidylcholine, CDP choline).

Persons with seizure disorders, asthma, and cardiac arrhythmias should avoid using huperzine A without a doctor’s approval.

Huperzine A, on the other hand, has been widely used for centuries in China for the treatment of fevers, inflammation and irregular menstruation, without reports of serious side effects.

Products:
Solaray: Hup A, 50 mcg huperzine A from Chinese moss, 285 mg gotu kola, 100 mg lecithin, 60 capsules.

Hydroxycitric Acid

See Garcinia Cambogia.

Indole-3-Carbinol

Related Item: Broccoli.

Description: Indole-3-carbinol is a substance found in cruciferous vegetables, such as cabbage and broccoli. It is actually released from the plant when it is crushed or cooked.

Uses: Indole-3-carbinol may have anticancer activity, especially relative to breast and cervical cancer. This may be due to its effect on estrogen metabolism. It also affects several other enzymes, some of which are directly involved in detoxification functions.

While the majority of studies support its value as a promising anti-cancer agent, some have pointed out that not all studies have been positive, and in some instances, it may have promoted cancer rather than suppressed it. This may be an aberration, and of little concern when using it to treat cancer. But some suggest that taking an extract,
or concentrate, of cruciferous vegetables, may be a preferable approach at this time when used as a preventative agent.

Indications: Cancer (cervical), cancer (breast).

Dosage: The amount being used ranges from 200 to 800 milligrams daily.

Products:
- Solaray: Indole-3-Carbinol, 100 mg I-3-C, plus 50 mg each of cabbage, Brussels sprouts, kale, broccoli, and cauliflower powders, 100 capsules.
- America’s Finest: Indole-3-Carbinol, 100 mg, 60 capsules.

**Inosine**

Description: Inosine is a substance (a purine ribonucleoside) widely found in all living matter. It is involved in purine synthesis, and is a precursor to adenosine, which is involved in energy production.

Uses: Inosine has been marketed as an ergogenic aid—a substance that will improve endurance and enhance athletic performance. This was based on some anecdotal reports from Russian and Eastern European athletes. Studies have shown, however, that inosine is not effective for this purpose.

On the other hand, inosine is used in certain pharmaceutical preparations in Europe, and may have some effect in cardiovascular disease, inflammatory conditions, and immune system disorders. It will be interesting to see if any of these uses show any validity.

At this time, there is no reason to supplement with inosine.

Cautions: Those with gout should avoid this supplement.

**Inositol**

Related Items: IP6 (Inositol hexaphosphate).

Description: Inositol is a vitamin-like substance that is not considered “essential” for humans. No inositol deficiency condition has been found, probably because it is so readily available in various foods. It is a primary component of cell membranes, functioning similar to choline.

Uses: While deficiencies of inositol are not a problem, some doctors have used high doses to treat certain types of depression and anxiety.

Inositol may be of benefit to diabetics in treating neuropathy. Inositol is also a common component of “lipotropic formulas,” to treat liver disorders and enhance the metabolism of fat in the liver.

Inositol, when obtained from the diet, is in the form of inositol hexaphosphate (phytate, or IP6) in plants and myo-inositol in animal products. Bacteria normally present in the intestine release the inositol from inositol hexaphosphate.

Indications: Anxiety, depression, obsessive-compulsive disorder, diabetes, liver disorders.

Dosage: For general liver-supporting, lipotropic activity, 100 to 500 milligrams daily are a common dose. For diabetics, amounts ranging from 1,000 to 2,000 milligrams can be used. For depression and anxiety, amounts in the 12-gram to 15-gram-per-day range are used, but this should be done under the supervision of a health professional.

Products:
- Jarrow: Inositol Powder, 600 mg inositol per quarter-teaspoon, 8 oz (227 gm).
- Solgar: Inositol, 650 mg, vegetarian and kosher, 100 tablets.

**Inositol Hexanicotinate**

See Niacin, No-Flush.
Inositol Hexaphosphate

See IP6.

Inulin

Related Item: FOS.
Description: Inulins are a group of oligosaccharides, found naturally in several vegetables and fruits, including Jerusalem artichoke. Like fiber, inulins are poorly digested in the human digestive system, but are fermented by beneficial bacteria in the colon. Thus, inulin functions as a prebiotic.
Uses: Inulin, like FOS, is said to be a prebiotic, a material that may promote the growth of beneficial bacteria. In providing “food” for beneficial bacteria, inulin is thought to improve colon function and boost gastrointestinal immunity, perhaps even helping to protect against colon cancer.
In facilitating the growth of beneficial bacteria, inulin suppresses the growth of detrimental, or pathogenic, bacteria. Inulin also shares many of the advantages of dietary fiber in general. Some have suggested that inulin may be helpful in lowering elevated cholesterol and triglyceride levels, but the quantities needed are as high, if not higher, than other forms of water-soluble fiber. So it would seem to make no sense to use inulin for this purpose when other forms of fiber (for example, psyllium, oat bran, or guar gum) are available.
Products:
NOW Foods: Inulin Powder, derived from chicory root, 8 oz powder.
Naturally Vitamins: Inuflora, 1,000 mg, derived from Jerusalem artichoke root, 120 tablets.

THE PHARMACIST SAYS: The term probiotic refers to friendly, or beneficial, bacteria. The best known example is Lactobacillus acidophilus. Probiotic bacteria favorably influence the intestinal-microflora balance, inhibiting the growth of harmful bacteria, promoting good digestion, and boosting immune function. A prebiotic, on the other hand, refers to a substance that enhances or supports the growth of probiotic bacteria. An example of a popular probiotic substance is FOS, or fructo-oligosaccharides.

Iodine

Description: Iodine is a trace element. In the thyroid gland, iodine is combined with the amino acid tyrosine to form the thyroid hormones.
Uses: A deficiency of iodine can lead to hypothyroidism and goiter. Overt iodine deficiency is now very rare in developed countries, however. For those with hypothyroidism, supplementing with iodine will be of benefit only if the condition is caused by or related to a deficiency in dietary iodine. Lacking such a deficiency, supplemental iodine is of dubious value.
Those who are strict vegetarians, however, may be at risk for iodine deficiency. Exclusion of fish, seaweed (sea vegetables), and iodized salt will result in a diet very low in iodine. Supplementation may be appropriate under these circumstances.
Some research indicates that iodine can be helpful to those suffering from fibrocystic breast disease.
Indications: Goiter, hypothyroidism, fibrocystic breast disease.
Dosage: The usual dose is 150 micrograms of potassium iodide.
In nutritional supplements, the source of iodine is usually a kelp concentrate.
Products:
Thorne: Iodine 225, 225 mcg iodine from potassium iodide, 60 capsules.
IP6

Related Items: Inositol, phytic acid.
Description: Inositol hexaphosphate (IP6) is a substance composed of inositol and phosphate. It is also known as phytic acid.
Uses: Inositol hexaphosphate is the form of inositol found in cereal grains and seeds. It is high in phosphate, and is a strong chelating agent, readily binding divalent metals such as calcium, magnesium, and zinc.
There is interest in IP6 as a possible treatment for some cancers, especially colon cancer, and perhaps breast cancer. Most of this is based on laboratory and animal studies, however. It remains to be seen if it exhibits the same anticancer activity in humans.
Because of its potential interference with the availability of essential minerals, including iron, it should not be taken with meals or supplements, and should not be used as a general immune system modulator.
Indications: Cancer (colon).
Products:
- Jarrow: IP6, 500 mg, 500 mg IP6 from 615 mg calcium magnesium inositol hexaphosphate, 120 capsules.
- Enzymatic Therapy: Cell Forte with IP6, 400 mg inositol hexaphosphate and 110 mg inositol, 120 capsules.

Ipriflavone

Description: Ipriflavone is a semisynthetic derivative of plant isoflavones. It is similar in action to the isoflavones genistein and daidzein from soy, but without the phytoestrogen activity.
Uses: Ipriflavone has been shown in numerous studies to be helpful in preventing osteoporosis and bone loss. Ipriflavone is actually approved as a drug for preventing osteoporosis in several European countries and Japan.
It does not have weak estrogenic activity, and may therefore be more suitable in certain instances than other isoflavones for men, as well as for women who are concerned about taking natural isoflavones with weak estrogenic properties.
Ipriflavone works best when used along with adequate calcium supplementation.
Indications: Osteoporosis.
Dosage: The usual dose is 600 micrograms daily, in divided doses.
Cautions: Numerous studies have shown ipriflavone to be effective and free of side effects. One study, however, much to everyone’s surprise, yielded contradictory results, (JAMA March 2001). In addition, this study found that women taking the ipriflavone had lower levels of lymphocytes than the placebo group. While this study has been criticized, and is only one negative study among a large number of positive studies, we feel obligated to report it.
Products:
- Enzymatic Therapy: Ostivone, 200 mg ipriflavone, 60 capsules.
- Solgar: Ipriflavone, 200 mg, 60 vegicaps.

Iron

Description: Iron is an essential element. It is a key component of hemoglobin, the oxygen-carrying component of red blood cells.
Uses: Too little iron is bad, as is too much. Too little iron leads to anemia, a life-threatening disorder. Iron deficiency is the most common nutritional disorder in the world. Too much iron on the other hand, can lead to serious problems as well.
Some nutritionists, concerned about the problems caused by too much iron, have become alarmists. Some consumers have become so frightened, they avoid multivitamin supplements that contain iron.
This may be a serious mistake. Iron is essential, and iron deficiency is a very common problem, and a serious
Once the body gets iron, it holds on to it very efficiently. This is by design. The biggest source of iron excretion is in menstrual blood loss. For this reason, men and postmenopausal women are less likely to become iron-deficient than are premenopausal women.

Does this mean that men and postmenopausal women do not require a regular source of dietary iron? Not at all. They just require less.

The Reference Daily Intake (RDI) for iron is 18 milligrams. The Dietary Reference Intake for iron is also 18 milligrams. The Upper Limit (UL), the upper level of intake considered to be safe for use by adults, is 45 milligrams.

Teenagers and premenopausal women should take supplements that contain at least the recommended daily level of 18 milligrams. Men and postmenopausal women can take a smaller amount if they prefer, perhaps in the 9- to 10-milligram range. Those who are concerned about iron should have their physician include the appropriate blood tests when they have their next scheduled exam. Those with elevated serum ferritin levels should be cautious in the use of iron-containing supplements.

There are a number of conditions beside overt iron-deficiency anemia that may benefit from iron supplementation: fatigue, depression, athletic performance, cold sores, immune system function, celiac disease, and restless leg syndrome. In each of these conditions, however, iron supplementation may help only if the condition is influenced by an iron deficiency. Excess iron intake over the amount needed to correct the deficiency is not recommended, unless under the guidance of a health professional.

There are a number of forms of iron used in supplements. One form, reduced iron, is commonly used in food fortification, but it is poorly absorbed and should be avoided. The other forms used in supplements—ferrous gluconate, ferrous fumarate—are well absorbed. Ferrous sulfate is often recommended by physicians, but may be the most irritating and constipating form or iron. Carbonyl iron is well absorbed but only when sufficient stomach acid is present. Vitamin C enhances the absorption of iron.

Indications: Anemia (iron deficiency).

Dosage: For general supplementation, a daily dose of between 9 and 18 milligrams is recommended. Greater amounts may be necessary during pregnancy, and for premenopausal women in general.

Note: For more information on the necessity for iron supplementation, refer to www.bestsupplementsforyourhealth.com.

Cautions: Those with a rare inherited condition called hemochromatosis must avoid iron supplements. Iron supplements should not be used for treatment of any type of anemia other than iron deficiency anemia; treatment of all anemia conditions should be under a physician’s supervision.

Products:
- Twinlab: Iron, 18 mg, 18 mg iron from ferrous fumarate, 100 capsules.
- Solgar: Gentle Iron, 25 mg, 25 mg iron as “non constipating” iron bis glycinate, 180 vegicaps.
- Natrol: Iron Liquid, 14.5 mg iron from iron bis glycinate, plus 100 mg vitamin C, B complex, and herbs, 8 oz liquid.

**Kava Kava**

Description: Kava (Piper methysticum) is a member of the pepper family. It is a popular drink in the Pacific Islands, used in ceremonies and celebrations, because of its calming and relaxing action. The main active constituent is kavalactones.

Uses: Kava is used as a treatment for anxiety, nervousness, and stress. Studies have shown kava to be as effective as certain antianxiety drugs, without the serious side effects.

While not as well documented, there is some evidence that kava also has muscle-relaxing and analgesic action. Kava is also under investigation for its possible anticonvulsant activity.

Kava seems to exert its relaxing, anti-anxiety action without as much sedating activity as some drugs. It has less
Chapter Five: The Best Supplements For Your Health - Revised

Kava

Description: Kava is a plant that is found in the South Pacific Islands. It is used in traditional medicine for its sedative and anxiolytic effects.

Uses: Kava is used to treat anxiety, stress, and insomnia. It is also used for muscle spasm, nervousness, and pain.

Cautions: At the time this was written, kava products were being withdrawn from the market in certain European countries, owing to reports of liver toxicity. Based on the widespread and long-term use of this product, with little indication of safety problems, it would seem to be an overreaction, but an investigation is ongoing.

Products:
- Natrol: Kavatrol, 400 mg kava kava ext (30% kavalactones), 400 mg blend of passion flower, chamomile, hops, schizandra, per 2 capsules, 60 capsules.
- Enzymatic Therapy: Kava-55, 150 mg kava kava ext, 55% kavalactones (82.5 mg), 60 softgels.

Kombucha

Description: Kombucha is a tea prepared from a mixture of bacteria and yeasts.

Uses: Kombucha will cure just about any disease known to man. Or at least that is what many people were ready and willing to believe. We hear frequently from people who are afraid to use a supplement because the inner seal on the bottle may not be completely attached. Others will worry themselves to the brink of mental paralysis because they are not sure if “take with meals” means before the meal, after the meal, or with dessert. And yet these same people were willing to accept a “starter culture” of mysterious fungal gloop, grow it in the remote dank recess of their basement, and then drink the stuff. All because someone said it cures everything from AIDS to baldness. Amazing, isn’t it?

Cautions: Avoid this product. First, most people thought kombucha was a mushroom, but it is not. Second, none of the claims were substantiated. And third, the material was easily contaminated with pathogenic bacteria, fungi, and possibly lead contamination from the ceramic containers it was often brewed in. Bottles of the product have a tendency to explode on store shelves.

If we are being overly subtle in our evaluation of this product, forgive us.

Kudzu

Description: Kudzu (Pueraria lobata) is a vine that is found throughout China and the Southeastern United States. The root has long been used in traditional Chinese medicine. The root contains high levels of isoflavones.

Uses: Interest in kudzu was stimulated by one study that suggested it may have some value as a treatment for alcoholism. Unfortunately, subsequent research has so far failed to support this function.

Products:
- Nature’s Herbs: Kudzu Power, 1 mg kudzu root extract (1% diadzin), 100 mg, kudzu root 450 mg, 60 capsules.
- Nature’s Way: Kudzu, 610 mg kudzu root and kudzu root extract (1 mg diadzin), 50 capsules.

Lactoferrin

Related Item: Colostrum.

Description: Lactoferrin is an iron-binding protein, normally found throughout the body. It is found in high concentrations in colostrum and breast milk.

Uses: Lactoferrin’s use as a supplement is based upon its ability to support immune system function. There are many explanations as to how it exerts this function, but the main action seems to be related to its ability to bind excess iron in the body. This deprives disease-causing microbes of iron, which is necessary for their growth and replication.

It seems to also have a beneficial effect on intestinal health, inflammatory conditions, and may prove to have an-
ticancer activity as well. Lactoferrin is present in colostrum, but high-potency lactoferrin supplements are usually derived from whey protein.

Products:
- Allergy Research: Laktoferrin, 350 mg lactoferrin (95% purity), derived from the milk of free-range cattle, 100 capsules.
- Jarrow: Lactoferrin, 250 mg, 250 mg low-iron lactoferrin from whey, 60 capsules.
- Jarrow’s Lactoferrin contains 250 mg of purified, low-iron lactoferrin, a glycoprotein from whey protein. One of the biological activities of lactoferrin comes from its powerful ability to bind iron (300 times that of serum transferrin). Low-temperature processing ensures this potency. Digestion of lactoferrin liberates the immune-supporting peptide lactoferricin B. Lactoferrin benefits intestinal health by promoting the growth of lactobacilli and bifidobacteria.

Larch, Western

Description: The western larch (Larix occidentalis) is used as a source of arabinogalactan (Larch arabinogalactan), which is a water-soluble polysaccharide composed of D-galactose and L-arabinose units.

Uses: Larch arabinogalactan is a type of dietary fiber, and may enhance the growth of friendly bacteria in the intestinal tract. If this is correct, Larch arabinogalactan functions as a prebiotic, and this may explain its apparent immune-enhancing action.

Arabinogalactan is also present in echinacea and certain species of mushroom. Some speculate that this may contribute to their immune activity as well.

Although there is considerable interest in this products’ immune-enhancing activity, published studies at this time are limited to animal and test-tube research. The final determination as to how this supplement compares to other more well-established products remains to be demonstrated.

Indications: Immune system.

Products:
- Eclectic Institute: Larix Powder, 3 oz.
- Jarrow: Larix 1000, 60 tablets.

L-Carnitine

See Carnitine.

Lecithin

Related Items: Choline, phosphatidylcholine, CDP-choline.

Description: Lecithin is a phospholipid—a mixture of fatty acids, glycerol, phosphoric acid, and choline. It is the choline content or, more specifically, the phosphatidyl choline content of lecithin that makes it so valuable as a nutritional supplement.

Uses: In the food industry, lecithin is used as an emulsifying agent. It is this emulsification action that led early health food advocates to think it might dissolve cholesterol deposits in the blood. While some studies indicate it helps those with elevated cholesterol levels, this action remains somewhat speculative.

More important is the fact that lecithin is a natural source of phosphatidylcholine.

Lecithin is available in several different forms. In the liquid form, as liquid lecithin, it contains about 38 percent oil and 62 percent phosphatides, of which only one-third is phosphatidylcholine. Liquid lecithin, then, provides only approximately 20 percent phosphatidylcholine at best. Liquid lecithin is available as an oil, or in softgel cap-
Dry or granular lecithin has had the oil removed, and thus contains about 95 percent phosphatides. This would result in a phosphatidylcholine content close to 30 percent.

If higher levels of choline are necessary, there are other types of supplements available, including phosphatidylcholine, CDP-choline, and choline. Please refer to those listings for more information.

Even though lecithin is not the most concentrated source of supplemental choline, it still has value. It is perhaps the best tolerated form, least likely to result in a fishy body odor, gastrointestinal upset, or other side effects sometimes associated with choline. For those with elevated cholesterol, other more powerful supplements may be available and better documented. But lecithin can be a useful component of a comprehensive cholesterol-lowering regimen.

Dosage: The dose can vary widely.

Products:
Solgar: Lecithin “95” Granules, 260 mg choline per tablespoon, 16 oz granules.
Solgar: Lecithin, 1,200 mg, 33 mg choline per capsule, 100 softgels.

Linseed Oil

See Flaxseed Oil.

Lipoic Acid

Related Items: Alpha-lipoic acid, thioctic acid.

Description: Lipoic acid is a fat-soluble, vitamin-like substance that works along with certain B vitamins in the metabolism of carbohydrates and other nutrients to produce energy.

Uses: Lipoic acid helps in the metabolism of carbohydrates, and can be of benefit to those with diabetes. It is especially valuable in the treatment of diabetic neuropathy.

Lipoic acid is also a powerful antioxidant. Lipoic acid functions to protect and regenerate both water-soluble and fat-soluble antioxidants (glutathione, vitamin C, vitamin E, and CoQ10).

Preliminary work suggests it might be of benefit to those with glaucoma.

Indications: Diabetes, diabetic neuropathy, glaucoma, anti-aging.

Cautions: Lipoic acid may cause diabetics to require a reduction of their dosage of insulin or other antidiabetic drugs.

Products:
Medical Research Institute: Glucotize, 300 mg time-release lipoic acid per tablet, 60 tablets.
Solgar Lipoic Acid, 120 mg, 60 vegicaps.
Jarrow: Lipoic Acid, 100 mg, pharmaceutical grade, 180 tablets.

L-Phenylalanine

Related Item: DL-phenylalanine.

Description: L-phenylalanine is an essential amino acid.

Uses: L-phenylalanine is thought to have antidepressant activity. Indications: Depression.

L-phenylalanine is a precursor to L-tyrosine, which in turn is a precursor to the neurotransmitters norepinephrine and dopamine. Increased levels of these neurotransmitter substances are thought to be associated with mood elevation and antidepressant effects.

Indications: Depression.

Dosage: Typically, between 375 and 2,500 milligrams can be used, preferably under the supervision of a health professional.
professional. Take between meals.
Cautions: L-phenylalanine is contraindicated in those with phenylketonuria, and those taking nonselective monoamine oxidase (MAO) inhibitors.

Products:
Solgar: L-Phenylalanine, 500 mg, 500 mg free-form L-phenylalanine, vegetarian and kosher, 100 vegicaps.

Lutein

Related Items: Carotenoids, zeaxanthin.
Description: Lutein, a carotenoid, is a fat-soluble, yellowish pigment found in plants, algae, and photosynthetic bacteria. Lutein and a related carotenoid compound, zeaxanthin, are found in the macula of the human retina and the lens of the eye.
Uses: It is thought that lutein and zeaxanthin function to protect the retina of the eye from age-related macular degeneration and cataract formation.
Indications: Cataracts, macular degeneration.
Dosage: Optimal dosage is yet to be determined, but between 6 and 20 milligrams per day are commonly used. Look for products containing flora glo lutein.
Cautions: Lutein and zeaxanthin should not be used for vitamin A deficiency as they are not converted to vitamin A.

Products:
Twinlab: Lutein, 20 mg, dry, water dispersed, from marigolds, 60 capsules.
Jarrow: Lutein, 20 mg, 20 mg lutein and 1 mg zeaxanthin, 60 softgels.

Lycopene

Related Items: Carotenoids, beta-carotene, lutein.
Description: Lycopene is one of the carotenoids, a fat-soluble, red-colored pigment found in certain plants and microorganisms. The best-known source of lycopene is tomatoes and processed tomato products.
Uses: Lycopene seems to be especially useful in relation to prostate cancer and lung cancer. Lycopene seems to be the most powerful antioxidant of all the carotenoids, but it is not clear if this totally explains its action against these cancers, or its antiatherogenic activity.
Indications: Cancer, cardiovascular disease, cholesterol problems, prostate cancer.
Dosage: The optimal dose is not known, but between 5 and 15 milligrams daily are often used. In a clinical trial of men with prostate cancer, two 15-milligram capsules daily was the dose utilized.
Lycopene is oil soluble, and its absorption might be enhanced when given in a preparation that is oil based, or with emulsifiers.
Products:
Jarrow: Lyco-Sorb, 10 mg lycopene, 4 mg gamma-tocopherol in a phospholipid delivery system, 60 softgels.
Nature’s Answer: Lycopene Alcohol Free, 28 drops contain 1,000 mg tomato extract providing 5 mg lycopene, 1 oz liquid.
Natrol: Lycopene, 15 mg, 15 mg “LycoMato” lycopene, and 535 mg tomato powder, 30 tablets.

Lysine

Description: L-Lysine is an essential amino acid.
Uses: Herpes simplex virus proteins are rich in L-arginine. It is thought that altering the ratio of lysine to arginine
may inhibit the replication of the herpes simplex virus. Lysine supplementation may therefore reduce the frequency and severity of cold sore, genital herpes, and shingles outbreaks. There is some preliminary evidence that lysine may enhance the absorption of calcium.

Indications: Herpes simplex virus, shingles, cold sores.

Cautions: There may be some connection between high levels of lysine and elevated cholesterol.

Products:
- Solgar: Lysine, 500 mg, vegetarian and kosher, 100 vegicaps.
- Solgar: Lysine, 1,000 mg, vegetarian and kosher, 100 tablets.
- Twinlab: Lysine, 500 mg, 100 capsules.

Ma Huang

See Ephedra.

Magnesium

Related Items: Magnesium oxide, magnesium citrate, magnesium glycinate (chelated).

Description: Magnesium is an important essential mineral, involved in almost every aspect of the body’s function. Magnesium deficiency is very common in America, partly due to our increasingly high intake of refined foods. The problem is especially serious in the elderly.

Uses: Magnesium deficiency is associated with ischemic heart disease, congestive heart failure, cardiac arrhythmias, diabetes mellitus, and hypertension. Magnesium supplementation is important in preventing and treating osteoporosis, and may be effective to some degree in asthma, migraine headaches, kidney stones, and strokes.

Calcium and magnesium are different from most other essential vitamins and minerals. In what way? The required amounts of most vitamins are in the milligram range, usually from 2 to 20 milligrams daily. The same can be said for the trace minerals, like zinc and copper. Others, like selenium, chromium, and biotin, are required in microgram quantities. It’s easy to get these vitamins and trace minerals in one or two multivitamin capsules a day. But not calcium and magnesium. For most of us, we are looking at a requirement of 1,200 milligrams calcium and 400 to 600 milligrams of magnesium. You cannot squeeze that into a one-a-day multivitamin!

Many doctors do their patients a disservice by telling them to “take a calcium supplement” or “take Turns.” What happens is that now the patient may go out, and in addition to taking a daily multivitamin, she takes a calcium supplement as well....and grumbles about having to “take so many pills!” What about magnesium? It’s not in the daily multivitamin, and it’s not in the calcium supplement. You’re not even getting the minimal government recommended daily quantity.

Calcium gets the headlines, but magnesium deficiency is more likely a bigger problem. And magnesium is extremely important to good health.

THE PHARMACIST SAYS: Larry Siegel, chief pharmacist at Willner Chemists, points out that magnesium is very important for heart function, specifically for heart muscle relaxation (after contraction). Vasospastic heart attacks, where the coronary arteries have little plaque buildup, have been linked to a magnesium deficiency.

The conventional guideline is that you should take half as much magnesium as calcium. So if you take 1,000 milligrams of calcium, you should try to take at least 500 milligrams of magnesium. The current “Daily Value” is 400 milligrams.

For convenience, we usually recommend a supplement that contains a combination of calcium and magnesium, in a 2 to 1 ratio, although magnesium supplements are available as well. Many nutritionists recommend a higher
ratio of magnesium to calcium. Those who have the health problems indicated here, for example, may want to add additional magnesium to their calcium/magnesium blend.

When increasing the amount of magnesium, be aware that high levels of magnesium may exert a mild laxative action for some people. Taking magnesium supplements with food, and in divided doses, will lessen that problem.

The most common form of magnesium in supplements is magnesium oxide. This is an inorganic form, and may not be absorbed as well as other forms, such as magnesium citrate, magnesium gluconate, and magnesium aspartate.

Indications: Cardiovascular disease, osteoporosis, asthma, migraine headaches, hypertension, diabetes, chronic fatigue syndrome.

Dosage: At least 320 to 420 milligrams per day.

Products:
- Ecological Formulas: Magnesium Taurate, 125 mg magnesium as magnesium taurate (this product especially useful for those with heart problems), 60 capsules.
- Thorne: Magnesium Aspartate, 90 mg magnesium as magnesium aspartate (well absorbed, but low in potency), 90 capsules.

### Magnesium Citrate

Related Item: Magnesium.

Description: Magnesium citrate is used as a source of magnesium in nutritional supplements.

Uses: Magnesium citrate is an “organic” magnesium compound thought to have improved absorption and tolerance over magnesium oxide.

For general supplementation, magnesium oxide is adequate. For therapeutic purposes, when optimal absorption and tolerance are required, magnesium citrate, glycinate, or aspartate might be preferred.

Magnesium citrate is the supplement of choice in certain specific conditions. One example is kidney stones. The most common type of kidney stone is the calcium oxalate type. Magnesium and citrate together function to reduce the incidence of this type of kidney stone. Consult with your doctor to be sure you do not have a different form before using magnesium citrate, however.

Indications: Cardiovascular disease, osteoporosis, asthma, migraine headaches, hypertension, diabetes, chronic fatigue syndrome.

Products:
- Solgar: Magnesium Citrate, 200 mg magnesium from magnesium citrate, 120 tablets.
- Allergy Research: Magnesium Citrate, 170 mg magnesium from magnesium citrate, 90 capsules.

### Magnesium Glycinate

Description: Magnesium glycinate (chelated magnesium) is an organic amino chelate of magnesium used as a source of magnesium in nutritional supplements.

Uses: Magnesium glycinate is a form of magnesium better absorbed, and perhaps better tolerated, than magnesium oxide. For general supplementation, the oxide form is adequate. For therapeutic purposes, however, magnesium glycinate, magnesium citrate, or magnesium aspartate may be preferred.

The glycinate or chelated form is very effective, but it has a lower level of magnesium, so a higher number of tablets may be required.

Indications: Cardiovascular disease, osteoporosis, asthma, migraine headaches, hypertension, diabetes, chronic fatigue syndrome.

Products:
Solgar: Chelated Magnesium, 100 mg magnesium from magnesium glycinate per tablet, 250 tablets.

**Magnesium Oxide**

Related Item: Magnesium.

Description: Magnesium oxide is an inorganic form of magnesium used as a source of magnesium in nutritional supplements.

Uses: Magnesium oxide contains 60 percent of “elemental” magnesium. It is inexpensive and commonly used as a source of magnesium. Even though it is inorganic, it is relatively well absorbed.

For general supplementation, magnesium oxide is adequate. For therapeutic purposes, when optimal absorption and tolerance is required, magnesium citrate, glycinate or aspartate, might be preferred.

Indications: Cardiovascular disease, osteoporosis, asthma, migraine headaches, hypertension, diabetes, chronic fatigue syndrome.

Products:
- Twinlab: Magnesium Capsules, 400 mg, 400 mg magnesium from oxide, 200 capsules.

**Maitake Mushroom**

Related Item: Medicinal mushroom.

Description: Maitake is a large mushroom found in the mountains of Japan, North America, and Europe. It is also called the “dancing mushroom.”

Uses: Certain mushrooms, such as maitake, have been shown to have immunomodulatory activity, as well as possible anti-tumor, antimicrobial, lipid-lowering, and glucose-regulating actions. The components thought to be responsible for this are polysaccharide complexes found in the cell walls of the organism. The active constituent is beta-D-glucan, or beta-glucans.

Maitake is rich in a certain type of beta-glucan, and has been shown to have a general immune system stimulatory action. It is used as a tonic and adaptogen. The regular maitake concentrate is also thought to be helpful in controlling cholesterol and lipid levels, as well as general immune problems.

The “D-fraction,” a special beta-glucan-enriched maitake product, is a more potent immune-stimulating product, and is being investigated as an anticancer agent.

Indications: Immune system, cancer, HIV.

Dosage: Follow instructions on the bottle.

Products:
- Nature’s Answer: Maitake Bio Beta Glucan, 1 ml contains 14 mg of beta 1,6 glucan with beta 1,3 branches, 2 oz liquid.
- Maitake Products: Maitake D Fraction, 20 drops contain 5.5 mg beta glucan, 4 oz liquid.
- Maitake Products: Grifron Pro Maitake D Fraction, 6 drops contain 6.6 mg beta glucan, 1 oz liquid.
- Maitake Products: Maitake Mushroom Grifron, whole maitake mushroom, a general immune tonic, 180 caplets.

**Makandi**

See Coleus Forskohlii.

**Malic Acid**

Description: Malic acid is an organic acid normally found in apples and other fruits. Malic acid is an intermediate
in the energy-producing pathway in the cells (the Krebs Cycle).

Uses: There is some evidence that malic acid, in combination with magnesium, may be helpful to those suffering from fibromyalgia. This has not been verified by scientific study.

Products:
Source Naturals: Magnesium Malate, 1,000 mg, supplies 152 mg magnesium and 825 mg malic acid, 180 tablets.
Nature’s Life: Magnesium Malate, 1,300 mg, supplies 200 mg magnesium and 1,100 mg malic acid, 100 tablets.
Nature’s Life: Malic Acid, 800 mg, 100 capsules.

Manganese

Description: Manganese is an essential trace element. The recommended daily intake level for manganese is between 2 and 5 milligrams, and 10 milligrams are considered “safe,” although levels in the 5- to 20-milligram range have been commonly used in nutritional supplements for some time now.

Uses: Manganese may be valuable as a dietary supplement owing to its role as an antioxidant (it is a component of the enzyme superoxide dismutase), and its anti-osteoporosis and anti-arthritic properties.
Supplemental manganese is available in several different forms—manganese glycinate (chelate), manganese gluconate, manganese sulfate, and manganese ascorbate. There is little reason to choose one over the other.
Do not confuse manganese with magnesium.
Indications: Arthritis (osteo), osteoporosis.
Dosage: Levels of 10 to 20 milligrams daily are common, but this is higher than the current government recommendations of 2 to 5 milligrams.

Products:
Solgar: Chelated Manganese Tablets, 50 mg manganese as manganese glycinate per 3 tablets, 250 tablets.
Twinlab: Manganese Caps, 10 mg manganese from manganese gluconate, 100 capsules.

MCHC

Related Item: Calcium.
Description: Microcrystalline hydroxyapatite (MCHC) is a type of purified bone meal.
Uses: Microcrystalline hydroxyapatite is used in supplements as a source of calcium. Theoretically, as is the case for bone meal, it might seem to be an ideal supplement, but clinical evidence is inconclusive. It is claimed that MCHC is less likely to have undesirable contaminants, such as lead. It obviously is not suitable for vegetarians. It is inorganic, and the calcium is in the form of a phosphate.
Indications: Osteoporosis, cancer (colon), hypertension.

Products:
Solaray: Calcium Hydroxyapatite, 4 capsules supply 1,000 mg calcium from 4,000 mg of calcium hydroxyapatite, 120 capsules.
Progressive Labs: MCHC Capsules, 250 mg, 4 capsules supply 1,000 mg calcium from calcium hydroxyapatite and calcium citrate, 120 capsules.
Ethical Nutrients: Bone Builder, 6 tablets supply 1,200 mg calcium from 3,000 mg calcium hydroxyapatite and 2,100 mg of dicalcium phosphate, 120 tablets.

MCT

See Medium-Chain Triglycerides.
Medicinal Mushroom

See Mushroom, Medicinal.

Medium-Chain Triglycerides

Description: Medium-chain triglycerides (MCTs) are more easy metabolized than the longer-chain fatty acids (oleic acid, linoleic acid). They contain between 6 and 12 carbon atoms. They do not require the digestive actions of pancreatic enzymes or bile salts. Nor is carnitine necessary for their transport into the mitochondria for energy production. MCTs yield slightly fewer calories than regular oils.

Uses: The most valid use of MCTs is as nutritional support for those with compromised digestive function. This could be due to serious illness, gastrointestinal disorders, carnitine deficiency, pancreatic disorders, liver disease, or problems with the lymphatic system.

Some have promoted this supplement as a weight loss aid or a means of enhancing athletic performance. These uses do not seem to be effective.

There is also some interest in the use of MCTs by those with epilepsy. This is based on the fact that MCTs are ketogenic. Ketogenic diets may reduce the frequency and severity of seizures.

Indications: Nutritional support.

Products:

Douglas Labs: MCT Oil, 8.4 g caprylic acid, 3.6 g capric acid per tablespoon, 8 oz liquid.

Melatonin

Description: Melatonin is a main hormone produced by the human pineal gland. It is involved in regulating the circadian rhythm (biological clock).

Uses: There have been a wide variety of claims made for melatonin supplements. Only one seems to have valid, practical application, and that is its use in treating sleeping problems and ameliorating the symptoms of jet lag. The human pineal gland normally secretes melatonin during periods of darkness. It is a signal to the body that it is time to sleep. Thus, taking supplemental melatonin sends a message to the body that it is time to sleep. Drowsiness should occur about thirty minutes after taking a melatonin supplement, and should last for at least one hour.

Melatonin also functions as an antioxidant, and has other possible roles as well. Claims have been made that it can be helpful in a great number of diverse conditions (cancers, headaches, depression, schizophrenia, tinnitus, aging, epilepsy, glaucoma, fibromyalgia, among others), but convincing proof of its value in these instances is lacking.

Indications: Insomnia, jet lag.

Dosage: A dose of between 1 to 3 milligrams seems to be sufficient. Those first starting out with melatonin should buy a 1-milligram strength, and then experiment with the dosage using from one to three capsules. Sustained-release products may be better for those who wake up after only an hour or two of sleep.

Cautions: The same commonsense cautions that apply to all medications and supplements that may cause drowsiness should apply as well to melatonin. Do not drive race cars, jet fighters, or heavy construction machinery after taking a melatonin supplement. Do not give melatonin to children. Do not take melatonin if you suffer from depression. Do not take melatonin if you are using alcohol or other sleep-inducing medications. Do not use melatonin if trying to become pregnant, if you are pregnant, or if you are nursing.

Products:

Source Naturals: Melatonin Liquid, orange flavor, 1 ml contains 1 mg melatonin, 2 oz liquid.

Allergy Research: S. Gard, 20 mg, highest-potency melatonin, 30 capsules.
Nature’s Way: Melatonin, 500 mcg sublingual, low-dose melatonin, 100 tablets.
Twinlab: Melatonin, 1 mg, 100 capsules.
Source Naturals: Melatonin Sublingual, 5 mg, orange flavor, contains 5 mg melatonin, 100 sublingual tablets.
Natrol: Melatonin, 3 mg T.R., 60 timed-release tablets.

**Methylcobalamin**

Related Items: Vitamin B12, cobalamin, dibencozide.
Description: Methylcobalamin is an active, or coenzyme, form of vitamin B12, (cobalamin).
Uses: There are two coenzyme forms of vitamin B12. Methylcobalamin is one, and adenosylcobalamin is the other. Adenosylcobalamin (dibencozide) is a cofactor for the enzyme L-methylmalonyl coenzyme A mutase, while methylcobalamin is a cofactor for the enzyme methionine synthase. Some claim that supplementation with methylcobalamin is preferable to supplementation with cobalamin, or vitamin B12, presumably because it might be more readily absorbed. What about the other vitamin B12 coenzyme? We are not completely convinced that supplementing with either of the coenzyme forms of B12 alone is as effective as supplementing with cobalamin (or hydroxocobalamin) in high doses.

Products:
- Jarrow: Methyl B12, 1,000 mcg, 100 lozenges.
- Jarrow: Methyl 812, 5,000 mcg, 60 lozenges.

**Methylsulfonylmethane**

See MSM.

**MGN3**

Related Items: Beta-glucan, medicinal mushroom.
Description: A combination of modified rice bran extract and shiitake mushroom. Chemically, an arabinoxylane, similar to beta-glucan.
Thought to be a stimulator of NK cell activity, enhancing immune system function, with specific antiviral, anticancer and anti-HIV activity.
Uses: Anticancer; antiviral.

Products:
- Lane Labs: MGN-3 Vegicaps, 2 capsules contain 500 mg of an Arabinobioxyylan Proprietary Complex, 50 capsules. Take 2 hours before or after other supplements.

**Microcrystalline Hydroxyapatite**

See MCHC.

**Milk Thistle**

Description: Milk thistle (Silybum marianum) grows wild, and is found throughout the world. The extract from the dried fruit (seeds) is used in preparing supplements.
Uses: Milk thistle has been shown to exert a protective effect on the liver, and is used as a treatment for hepatitis, liver cirrhosis, and alcohol-induced liver disease.
This well-studied herb should be used whenever exposure to liver toxins is anticipated. For example, we would recommend that anyone who works in a dry-cleaning business, photographic darkroom, or chemistry laboratory take milk thistle extract as part of their daily supplement regimen.

The main active ingredient in milk thistle is thought to be the flavonoid complex silymarin. Standardized milk thistle supplements are available, standardized to 80 percent silymarin.

The official European (Commission E) list of approved uses for the standardized extract includes toxic liver damage, and supportive treatment in chronic inflammatory liver disease and hepatic cirrhosis.

Indications: Hepatitis, cirrhosis (liver).

Dosage: For chronic liver disease, milk thistle may have to be considered long-term therapy. For other conditions, 420 milligrams of silymarin, from standardized milk thistle, should be taken daily, in divided doses. It should be taken for at least 6 to 8 weeks.

Products:
- Solgar: Milk Thistle Herb Extract, 175 mg milk thistle extract (aerial, seed) standardized to 80% silymarin, 140 mg, plus 300 mg milk thistle powder (aerial), 60 vegicaps.
- Nature’s Answer: Milk Thistle Seed, 2,000 mg milk thistle seed fluid extract per 2 ml (56 drops), 1 oz liquid.
- Nature’s Way: Thisilyn, 175 mg “thisilyn” milk thistle seed extract standardized to 80% silymarin, 100 capsules.

Mixed Tocopherols

Related Item: Vitamin E.

Description: Mixed tocopherols consist of a mixture of all four tocopherols (alpha, beta, gamma, and delta). It can also contain the four tocotrienols. Each of the eight isomers has activity, and some have different actions.

Uses: Vitamin E is an important antioxidant. Because it is fat-soluble, it exerts its protective effect very efficiently at the cell-membrane (which contains a high proportion of fat) level. Vitamin E is now recognized, even by mainstream medicine, as protective against cardiovascular disease and some forms of cancer. It may also be of benefit to those with rheumatoid arthritis, asthma, neurological diseases, cataracts, diabetes, and premenstrual syndrome. It can protect against environmental toxins and enhances immune system function.

For maximum potency and the broadest spectrum of activity, we recommend using mixed tocopherols, with tocotrienols, as the supplement of choice for vitamin E.

Cautions: Those taking blood-thinning medication should be aware that vitamin E may also exert some blood-thinning action. Their prothrombin times should be monitored, and the amount of medication (Coumadin) should be adjusted accordingly.

Products:
- Yasoo Health: Vitamin E Factor 400/400, 400 IU vitamin E as d-alpha tocopherol, 400 mg beta, gamma, and delta tocopherols, 31 mg gamma tocotrienol, 5 mg alpha, beta, and delta tocotrienols, 60 softgels.
- Solgar: E 400 Mixed Tocopherols, 400 IU vitamin E as d-alpha tocopherol, plus beta, gamma, and delta tocopherols, 250 softgels.

Modified Citrus Pectin

Related Item: Pectin.

Description: Modified citrus pectin is citrus pectin that has been chemically hydrolyzed, that is, broken down to smaller molecular weight fragments. This may make it more absorbable.

Uses: Modified citrus pectin is thought to possibly have anti-cancer activity, particularly for prostate cancer. This is based primarily on test-tube and animal studies. Just how applicable this is to humans remains to be demon-
Molybdenum

Description: Molybdenum is an essential trace mineral. It plays a role in certain enzyme systems, including the enzyme sulfite oxidase, which is necessary to detoxify sulfites.
Uses: A deficiency of molybdenum can have life-threatening consequences. Fortunately, overt deficiency is rare. It is most often seen when patients are placed on total parenteral nutrition (TPN), or when they live in areas where the soil is low in molybdenum. In one such instance, in northern China, it was determined that low soil molybdenum levels was responsible for the unusually high incidence of esophageal cancer.
Molybdenum is antagonistic to copper, and there is some interest in the use of high doses of molybdenum to suppress copper, and thus suppress tumor growth.
Another possible effect of molybdenum supplementation is to prevent sulfite sensitivity. Sulfites, as preservatives, are no longer used as commonly as in the past, but those with sulfite sensitivity remain susceptible to allergic reactions. Molybdenum deficiency can enhance this problem.
Indications: Asthma (sulfite sensitivity), cancer.
Dosage: The recommended daily intake of molybdenum is 75 micrograms. In supplements, the amount used can vary from 50 to 250 micrograms.
Molybdenum is easily absorbed, and the form used does not seem to be overly important. In fact, molybdenum seems to be more efficiently absorbed from supplements than from food.
Products:
Solgar: Chelated Molybdenum, 150 mcg molybdenum as molybdenum amino acid chelate, 100 tablets.
Allergy Research: Liquid Molybdenum, 25 mcg molybdenum as ammonium molybdate, 1 oz liquid.

MSM

Description: Methylsulfonylmethane (MSM) is an organic sulfur-containing mineral supplement found naturally in a wide variety of foods. It is a metabolite of DMSO (dimethyl sulfoxide).
Uses: MSM is recommended as a treatment for disorders such as osteoarthritis. Sulfur is a component of the amino acids methionine and cysteine, and may be involved in maintaining the integrity of joints and connective tissue. Many report that it reduces the pain and discomfort associated with various types of musculoskeletal problems.
MSM is widely used, and anecdotal reports of benefit abound. But scientific support is lacking.
Products:
Doctor’s Best Best MSM, 1,000 mg, 180 capsules.
Jarrow: MSM Powder, 200 g.
Twinlab: MSM, 1,000 mg, 120 tablets.
Natrol: MSM, 500 mg, 200 capsules.

Mushroom, Medicinal

Related Items: Maitake, reishi, shiitake
Description: A mushroom is a type of fungus. Some mushrooms are edible and some are poisonous. Others have been used for centuries as medicinal agents.

Uses: Certain mushrooms have been shown to have immunomodulatory activity, as well as possible antitumor, antimicrobial, lipid-lowering, and glucose-regulating actions. The components thought to be responsible for this are polysaccharide complexes found in the cell walls of the organism. The active constituent is beta-D-glucan, or beta-glucans.

There are a number of mushrooms currently being used medicinally. In addition to maitake, reishi, and shiitake, there is cordyceps, coriolus, and others.

Products:
Maitake Products: Super Tremella, 700 mg tremella fruit body, 300 mg tremella 8:1 extract, plus maitake D-fraction, vitamin C, and bioperine. (Tremella fuciformis), 120 tablets.
Maitake Products: Super Royal Agaricus, 500 mg agaricus fruit body, 400 mg agaricus 12:1 extract, plus maitake D-fraction, vitamin C, and bioperine (Agaricus blazei), 120 tablets.
Maitake Products: Super Shiitake, 700 mg shiitake fruit body, 300 mg shiitake 12:1 extract, plus maitake D-fraction, vitamin C, and bioperine (Shiitake edodes), 120 tablets.
New Chapter: Reishi 5, combination of reishi, shiitake, maitake, cordyceps, and coriolus mushroom extracts, 60 vegicaps.

NAC

See N-Acetyl-Cysteine.

N-Acetyl-Cysteine

Related Items: Cysteine, glutathione.

Description: N-acetyl-cysteine (NAC) is a derivative of the non-essential, sulfur-containing amino acid cysteine. It is more stable than cysteine, and may be better absorbed.

Uses: N-acetyl-cysteine is an antioxidant. As a source of cysteine, it is a precursor to glutathione, a powerful antioxidant.

NAC is known to function as a mucolytic, liquifying overly viscous mucus. It exerts a strong protective action on the liver, owing most likely to its antioxidant and glutathione regeneration activities.

NAC is used, in high doses, to counteract acetaminophen poisoning.

Indications: Liver disorders, hepatitis, lung disease, detoxification, cardiovascular disease, bronchitis, immune system.

Products:
Jarrow: NAC, 600 mg, Sustain, sustained release formula, 100 tablets.
Solgar: NAC, 600 mg vegicaps, vegetarian and kosher, 120 vegicaps.
Source Naturals: NAC, 1,000 mg, 120 tablets.

NADH

Description: Nicotinamide adenine dinucleotide (NAD) is a natural substance found throughout the body and involved in energy production. It is the active, coenzyme form of niacin (vitamin B3). NADH is the reduced form of NAD. Some products contain NAD and some contain NADH. Because the two substances are converted from each other as part of normal redox reactions (oxidation-reduction) related to metabolic energy production, many people think that they are effective. But it seems that NADH, in an enteric-coated form, is the more active of the
two—especially in supplement form.

Uses: Supplemental NADH is being used as a treatment for Parkinson’s disease, chronic fatigue syndrome, and Alzheimer’s disease. Early indications are that it may be effective, but scientific evidence of its efficacy in this form is lacking.

Enteric-coated or otherwise modified forms are claimed to provide better stability.

Products:
- Menuco: Enadalert, 10 mg, sublingual, 8 tablets. For jet lag, take 1 hour before traveling between time zones.
- Menuco: Enada, 5 mg, patented enteric-coated formula, 30 tablets.

**Niacin**

Related Items: Niacinamide, no-flush niacin.

Description: Niacin is one of the B vitamins. It is also called nicotinic acid and vitamin B3. Niacin is sometimes used as a general term to include niacinamide. Both niacin and niacinamide have similar vitamin activity, but they differ in certain other respects. (Niacinamide is discussed below.) A deficiency of niacin causes the disease pellagra. Medical students remember the signs of pellagra as the four D’s, i.e., dermatitis, diarrhea, dementia, and death.

Uses: Beyond its role in preventing deficiency symptoms, niacin currently receives most attention as a result of its role in lowering serum cholesterol, LDL cholesterol, VLDL cholesterol, and triglycerides, while increasing serum levels of HDL cholesterol. Many studies have shown niacin to be as good as, or better than, many of the commonly used prescription drugs used for lowering elevated cholesterol.

The only drawback to the use of niacin for this purpose is that at high doses, it causes a skin flush reaction over the face, neck, and chest. By starting with a lower dose, and gradually increasing the dose over a period of weeks, this problem can be alleviated. Also, taking the niacin with meals will reduce the problem.

In an attempt to avoid the skin flush problem, some turned to a time-release or delayed form of niacin. This did indeed reduce the skin flush problem. There was some initial concern that this form might have been more likely to cause liver problems, but this is no longer an issue. If anything, it might be a little more likely to cause gastric discomfort.

Another solution is “no-flush” niacin, or inositol hexanicotinate. This form of niacin has been used for many years in Europe, seems to have the desired effect on cholesterol, does not cause liver problems, and does not cause a flush. (See Niacin, No-Flush, for additional information.)

Indications: Cholesterol problems, Raynaud’s phenomenon, intermittent claudication.

Dosage: For general nutritional supplementation, niacin or niacinamide is usually included in multivitamin supplements at levels of 50 to 200 milligrams. The recommended daily intake level is 20 milligrams.

For lowering cholesterol, the daily dose can vary between 1,500 and 3,000 milligrams. Regardless of the form of niacin used, when taking this high an amount, it should be done under the supervision of a health professional.

Cautions: High doses of niacin, over 1.5 grams daily, may impair glucose tolerance, both in diabetics and non-diabetics.

Products:
- Carlson: Niacin Time, 500 mg, 100 tablets. Gradual release over 5 to 7 hours.
- Solgar: Niacin, 500 mg, vegetarian and kosher, 250 vegicaps.

**Niacin, No-Flush**

Related Item: Niacin.

Description: Niacin is one of the B vitamins. It is also called nicotinic acid and vitamin B3. Niacin is sometimes used as a general term to include niacinamide. Both niacin and niacinamide have similar vitamin activity, but
niacinamide does not have the same cholesterol-lowering action. To lower cholesterol, niacin, or the form of niacin known as inositol hexanicotinate, must be used.

Uses: Niacin has been shown to be an effective agent in lowering serum cholesterol, LDL cholesterol, and triglycerides. Niacin, when used at the high dose required to achieve this effect, can cause an uncomfortable skin flush reaction on the face, neck, and chest.

Inositol hexanicotinate, or no-flush niacin, exerts the same cholesterol-lowering effect, without the annoying skin flush reaction.

Indications: Cholesterol problems, Raynaud’s phenomenon, intermittent claudication.

Dosage: The recommended dosage can range from 500 to 4,000 milligrams daily, with meals.

Cautions: Even though there are no reports of liver toxicity with this product, caution is recommended. Some are concerned that, theoretically, since it behaves similarly to time-release niacin, liver function should be carefully monitored. It should be used at these dosages only under the supervision of a health professional.

Products:
   Twinlab: No Flush Niacin, 800 mg, 640 mg of niacin per capsule, 100 capsules.
   Solgar: No Flush Niacin, 500 mg, 450 mg of niacin per capsule, 100 vegicaps.

Niacinamide

Related Item: Niacin.
Description: Niacinamide is one form of vitamin B3 (niacin). Both forms have the same vitamin activity, but they differ in their nonvitamin actions.

Uses: While niacin is a powerful cholesterol-lowering agent, niacinamide does not have this activity. Nor does niacinamide cause a skin flush. For this reason, niacinamide is the preferred form of vitamin B3 for use in multi-vitamin formulas.

Niacinamide is the precursor to NAD/NADH and is involved in the production of energy and the synthesis of fatty acids, cholesterol, and steroids.

There is considerable interest in niacinamide as a possible agent useful in preventing or delaying the onset of Type 1 diabetes mellitus (insulin-dependent diabetes mellitus, or IDDM).

Dosage: For general vitamin supplementation, the dosage range is 20 to 100 milligrams daily. For therapeutic purposes, i.e., diabetes, osteoporosis, higher dosages are used, but this should be done under the supervision of a health professional.

Indications: Diabetes, arthritis (osteo).

Products:
   Twinlab: Niacinamide, 100 mg, 100 mg niacin from niacinamide, 100 capsules.
   Solgar: Niacinamide 550, 550 mg niacin from niacinamide, 100 vegicaps.

Nicotinamide Adenine Dinucleotide

See NADH.

Nicotinic Acid

See Niacin.

No-Flush Niacin

See Niacin, No-Flush.
Octacosanol

Related Item: Policosanol.
Description: Octacosanol is a waxy substance found in various vegetable or plant waxes, including wheat, sugar cane, yams and wheat germ.
Uses: Octacosanol is the main long-chain alcohol found in policosanol.
This would lead to speculation that it might have some cholesterol-lowering activity, but this has not been confirmed.
The main interest in octacosanol supplements is the claim that it can boost energy, athletic performance, and male sexual performance. This is an outgrowth of work done back in the early 1970s by Cureton, using an extract of wheat germ oil. Unfortunately, in over thirty years, no research has been produced to substantiate these early claims.
Claims that it may be of some benefit in Parkinson’s disease are preliminary, and yet to be confirmed.
Products:
Solgar: Octacosanol 2000, 2,000 mcg of octacosanol from wheat germ oil, 90 vegicaps.
Twinlab: Octcosanol 8000, 8,000 mcg of octacosanol from spinach, 60 capsules.

OKG

See Ornithine Alpha-Ketoglutarate.

Olive Leaf Extract

Description: The olive tree is a small evergreen native to the Mediterranean region. Olive oil, of course, is well known and highly respected. But olive leaf has unique medicinal value. The leaf contains oleuropein and various flavonoids.
Uses: Olive leaf has been used for various cardiovascular problems, especially high blood pressure. It is popular in Europe as a treatment for mild to moderate hypertension. There is also speculation that the oleuropein in olive leaf may inhibit the oxidation of LDL cholesterol.
Historically, olive leaf has been used as a treatment of wounds and infection. Currently, this use has gained a good deal of support as a result of a number of studies supporting the antimicrobial activity of various components of olive leaf. Under certain conditions, the oleuropein in olive leaf is converted to elenolic acid, which has antiviral activity.
While there has been considerable interest in the use of olive leaf extract as a treatment for various viral, fungal, and bacterial infections, most of the research in support of this is based on test-tube and animal studies. A study on the antiviral activity of calcium elenolate on parainfluenza infection in hamsters, for example, does not necessarily mean that olive tree extract will have antiviral activity in humans.
Indications: Hypertension, immune system.
Dosage: Most commonly, 250 to 500 milligrams of standardized extract, three times a day.
Products:
Solaray: One Daily Olive Leaf, 1,000 mg of olive leaf extract (17% oleuropein), providing 170 mg of oleuropein, 30 capsules.
Allergy Research: Prolive, 500 mg of olive leaf extract (10% oleuropein), providing 50 mg of oleuropein, 60 tablets.
Nature’s Answer: Oleopein Vegicaps, 400 mg of olive leaf extract and 20 mg of olive leaf powder providing 30 mg of oleuropein, 60 vegicaps.
Seagate: Olive Leaf Extract Vegicaps, olive leaf extract prepared by a water extraction process; oleuropein content not provided, 90 vegicaps.

**Omega-3 Oils**

See Fish Oil.

**OPC**

Related Items: Grape seed extract, Pycnogenol.

Description: OPC (oligomeric proanthocyanidin) is a type of flavonoid found in grape seed extract and maritime pine extract (Pycnogenol). OPCs are also found in cocoa (and chocolate), bilberry, grape skin, green tea, black tea, black currant, cranberry, apples, peanuts, and almonds.

Use: OPCs, also called PCOs, represent a type of flavonoids thought to function as a powerful antioxidant, protecting tissues, glands, and organs throughout the body from the deleterious effects of free-radical damage. In addition, they have an ability to strengthen collagen. This explains their value in enhancing the integrity of skin, blood vessels, and connective tissue. They exert an anti-inflammatory action, perhaps by inhibiting the release of pro-inflammatory prostaglandins. There is also compelling evidence that the proanthocyanidins have anticarcinogenic activity.

Products containing OPC flavonoids are considered by many to be the most valuable and inclusive antioxidants available and should be part of any comprehensive supplement program.

Note: There are two types of supplements available that are rich in OPCs. One is grape seed extract and the other is a trademarked product called Pycnogenol, which is derived from pine bark. There have been claims and counterclaims as to which is better. Much of this is a result of an initial multilevel program involving Pycnogenol. Marketing hyperbole to the contrary, they are similar in composition and function. Grape seed extract contains between 92 and 95 percent OPCs, while Pycnogenol products contain only 80 to 85 percent OPCs. Considerable research has been performed on grape seed extract, and in Europe, it is the more popular of the two supplements. Finally, grape seed extract is often less expensive.

Products:
- Seagate Gold: Grape Seed Extract, 250 mg, 150 mg red grape seed extract, 100 mg red grape skin extract, 90 capsules.
- Jarrow: OPCs+95, 100 mg grape seed extract (100:1), 95% polyphenols, 100 capsules.

**Oregano Oil**

Description: Oregano (Origanum vulgare) has a long history as a food spice and medicinal herb.

Uses: Oregano is an aromatic herb, containing volatile oils. Volatile oils are known to possess antimicrobial properties, and their antifungal and antibacterial action is easily demonstrated in the test tube. There is little question but that this action can be utilized to advantage in topical products, for the treatment of fungal infections and similar problems.

The claims being made that oral oregano supplements can cure almost any disease known—or soon to be discovered—by man is not justified. In most cases, the basis for such claims are test-tube experiments that may or may not reflect similar action when oregano is taken orally by humans.

Alcohol is a powerful antimicrobial agent in a test tube. But that does not mean that two shots of vodka three times a day will cure systemic candidiasis.

In small doses, oral ingestion of oregano oil seems harmless, and the same can be said for larger doses of dried oregano herb. Perhaps its value as a systemic antibacterial, antifungal and antiparasitic agent will be demonstrated.
eventually, but at this time we are more comfortable with its use as a topical treatment.
Indications: Fungal infections (topical).

Products:
- NAH: Oregamax Capsules, 100% wild oregano, 2 caps contain 1,100 mg of a proprietary blend of oregano, Rhus coriaria, garlic, and onion, dry powder, 90 capsules.
- NAH: Super Oregano Oil, 2 drops contain 60 mg of a proprietary blend, 1 oz liquid.
- Nature’s Answer: Oregano Oil Alcohol Free, 4 drops supply 13 mg oil of oregano leaf extract containing 7 mg of carvacrol, 1 oz liquid.
- Nature’s Herbs: Oregano Power, oregano leaf oil, 20 mg, and rosemary leaf extract, 20 mg, 60 softgels.
- NOW Foods: Oregano Oil, 0.2 ml oil of oregano containing 55% carvacrol, 90 softgels.

Oregon Grape

Description: Oregon grape (Berberis aquifolium) root contains berberine alkaloids, similar to goldenseal and barberry. It is an evergreen shrub, native to northwest North America.
Uses: Oregon grape is used for many of the same conditions as is goldenseal. In addition, it has been shown to be of some value in treating chronic skin conditions (acne, psoriasis, and eczema).
Indications: Immune system, skin disorders, psoriasis, canker sores, gastrointestinal disorders, parasites.

Products:
- Nature’s Answer: Oregon Grape Drops, 1,000 mg of Oregon grape root in 28 drops, 1 oz liquid. Do not use for longer than 4 weeks.
- Solaray: Oregon Grape Root, 400 mg, 100 capsules.

Ornithine

See Ornithine Alpha-ketoglutarate.

Ornithine Alpha-Ketoglutarate

Description: L-ornithine is a nonessential, nonprotein amino acid. Ornithine can serve as a precursor to L-arginine, L-glutamine, and proline.
Uses: Ornithine, especially in combination with arginine, is thought to promote increased levels of growth hormone and insulin, and promote muscle growth. Just how valid this claim might be is somewhat questionable, especially at reasonable dosage levels.
A form of ornithine, ornithine alpha-ketoglutarate (OKG) is used medically to support burn and trauma patients, the chronically malnourished, and postsurgical elderly. It seems to enhance wound healing and may have some immunomodulating action.
Indications: Wound healing, athletic performance.
Dosage: The use of either ornithine or ornithine alpha-ketoglutarate for medical conditions should be done under medical supervision. Athletes typically use 2 or 3 grams several times a day, although there is little evidence that this is beneficial.

Products:
- Twinlab: Ornithine, 500 mg, as L-Ornithine HCl, 100 capsules.

Orthosilicic Acid

Related Item: Silicon.
Description: Orthosilicic acid is a soluble form of silicon. Other forms of silicon, from horsetail or silicon dioxide, have to be converted to orthosilicic acid before being absorbed.

Uses: Silicon is an essential mineral thought to be required for the strength and elasticity of bones, joints, connective tissue, hair, skin, nails, mucous membranes, and arteries.

A 2 percent stabilized solution of orthosilicic acid may be the best utilized form of silicon.

Indications: Hair, skin, and nails, osteoporosis.

Dosage: The liquid form contains about 1 milligram silicon, as orthosilicic acid, per drop. The recommended dosage is 6 to 20 drops daily, mixed with juice or water.

Products:
Jarrow: Biosil Liquid, 6 drops contain 6 mg silicon from orthosilicic acid, 1 oz liquid.

Oyster Shell Calcium

See Calcium Carbonate.

Pantethine

Related Item: Pantothenic acid.

Description: Pantethine is an active metabolite of pantothenic acid (vitamin B5), the precursor to coenzyme A.

Uses: Pantethine seems to have a lipid-lowering action not shown by pantothenic acid. It may be useful in lowering total cholesterol, LDL cholesterol, and triglyceride levels while increasing HDL cholesterol.

Dosage: The typical dose for treating elevated cholesterol seems to be 300 milligrams, three times a day.

Indications: Cholesterol problems, cataracts, cardiovascular disease, detoxification.

Cautions: Exceptionally safe and nontoxic.

Products:
Jarrow: Pantethine, 300 mg, 60 softgels.

Pantothenic Acid

Related Item: Pantethine.

Description: Pantothenic acid (vitamin B5) is one of the water-soluble, B-complex vitamins. It is essential for the metabolism of fatty acids, amino acids, and carbohydrates. A clinical deficiency is rare but usually involves the skin, liver, adrenals, and nervous system.

Uses: Pantothenic acid works together with the other B vitamins for proper energy production and lipid synthesis. It is thought to be useful in treating stress, owing to its support of adrenal hormone production, and to be helpful in rheumatoid arthritis, acne, and lupus.

The usual form of pantothenic acid used in nutritional supplements is D-calcium pantothenate. The corresponding free alcohol form, dex-panthenol, is also available, but is typically used in topical products.

There is another form of pantothenic acid, pantethine. Pantethine is a metabolite of pantothenic acid, which differs in one very significant way—pantethine has a marked lipid-modulating action, while pantothenic acid does not. See Pantethine for more information.

Indications: Arthritis (rheumatoid), stress, skin disorders.

Dosage: The recommended daily value is 10 milligrams, but the amounts found in supplements typically run between 25 and 50 milligrams, or more.

Products:
Solgar: Pantothenic Acid, 550 mg, 550 mg calcium pantothenate providing 500 mg pantothenic acid, 100 vegicaps.
Twinlab: Pantothenic Acid, 500 mg, 550 mg calcium pantothenate providing 500 mg pantothenic acid, 100 capsules.

PCO

See OPC.

Pectin

Related Items: Fiber, modified citrus pectin.
Description: Pectin is a soluble fiber. It is found commonly in citrus fruits and apples. When obtained from citrus peel, it is referred to as citrus pectin.
Uses: Pectin is used in foods as a gelling or thickening agent. It is used in combination with kaolin, a clay, for the management of diarrhea.
As a nutritional supplement, it may be helpful in lowering elevated cholesterol.
Indications: Cholesterol problems, constipation, diarrhea, weight loss.
Dosage: Typical doses range from 5 to 15 grams daily, before meals or at bedtime.
Cautions: If you are not accustomed to fiber supplementation, start out with small doses and gradually increase the amount.
Products:
Solgar: Apple Pectin Powder, 8 oz.
Twinlab: Apple Pectin USP Capsules, 500 mg apple pectin, USP, 10 mg vitamin C, 100 capsules.

Peppermint Oil

Description: Peppermint (Mentha piperita) is a perennial aromatic herb. It is a natural hybrid of water mint and spearmint. The main volatile oil in peppermint is menthol.
Uses: Peppermint oil is used internally as an antispasmodic, carminative, and cholagogue. An interesting external use involves application of peppermint oil to the temples as a treatment for headaches.
The use of enteric-coated peppermint oil capsules, either alone or mixed with caraway oil, seems to be an effective treatment for irritable bowel syndrome and other gastrointestinal problems.
Indications: Irritable bowel syndrome, gastrointestinal disorders, digestive aid.
Dosage: For irritable bowel and similar problems, take one or two enteric-coated capsules, two or three times daily. For digestive disorders, use peppermint tea as needed, or take one or two regular capsules, two or three times daily.
Cautions: Use caution when giving peppermint to small children, especially as a tea. Also, use caution when obstruction of the bile ducts, gallbladder inflammation, or liver damage is a possibility.
Products:
Enzymatic Therapy: Peppermint Plus, 0.4 ml peppermint oil, plus thyme and rosemary oils in 2 capsules, 60 softgels.
Nature’s Way: Pepogest, 0.2 ml peppermint oil per capsule, 60 softgels.

Phosphatidylcholine

Related Items: Choline, lecithin, CDP-choline.
Description: Phosphatidylcholine is a form of choline used in dietary supplements.
Uses: Choline is important for the formation and maintenance of normal cellular membranes, brain function,
cardiovascular function, and liver function.

Choline is available alone, as choline bitartrate, choline citrate, or choline chloride. While these forms provide the highest level of choline per dose, they are not as well tolerated as phosphatidylcholine, which is obtained from lecithin. High doses of phosphatidylcholine, for example, will not cause the fishy odor that results from high doses of choline.

Indications: Alzheimer’s disease, cholesterol problems, liver disorders, hepatitis, manic depression, mental function, Parkinson’s disease, tardive dyskinesia.

Dosage: The amount taken as a supplement can vary over a wide range. The new “dietary reference intake” is 550 milligrams daily and the suggested “upper limit” is 3,500 milligrams daily. The usual dose of phosphatidylcholine is 500 to 1,000 milligrams daily.

It is important to note that the amount of actual “choline” varies with the source. Phosphatidylcholine contains about 13 to 15 percent choline. A 500-milligram phosphatidylcholine capsule, therefore, provides only about 70 milligrams of actual choline. The potency of phosphatidylcholine supplements (not lecithin supplements) can vary, however, from 55 to 90 percent phosphatidylcholine, so it is necessary to read the label carefully. Liquid concentrates are available as well.

Cautions: At levels of over 3 grams per day, some people experience gastrointestinal discomfort.

Products:
Solgar: Phosphatidylcholine, 1,200 mg, 400 mg phosphatidyl choline from 1,200 mg phosphatidylcholine complex, 100 softgels.
American Lecithin: Phos Chol 900, contains 900 mg pure phosphatidylcholine, 100 softgels.
American Lecithin: Phos Chol Concentrate, 1 tablespoon contains 9 G pure phosphatidylcholine, 8 oz liquid.

**Phosphatidylserine**

Description: Phosphatidylserine is a phospholipid that is an integral component of the cell membrane in all life forms. It is found in high concentrations in brain tissue. Other phospholipids are phosphatidylcholine and phosphatidylethanolamine.

Uses: Phosphatidylserine has been shown to be useful in treating conditions such as Alzheimer’s disease, age-associated memory impairment, and other types of dementia.

Most of the research on phosphatidylserine has been done with material derived from bovine brain tissue. The material available in the United States for use in supplements is derived from soy lecithin. It is not exactly the same as the material in animal brain tissue, but seems to have the same effect.

Indications: Age-related cognitive decline, Alzheimer’s disease, depression, Parkinson’s disease.

Dosage: The usual dose is about 300 milligrams daily.

Products:
Progressive Labs: Phosphatidylserine Licaps (Liquid Vegetable Capsules), 100 mg phosphatidylserine, 50 mg phosphatidylcholine, 60 softgels.
Jarrow: PS-100, 100 mg phosphatidylserine, 45 mg phosphatidylcholine, 3 mg gamma-tocopherol, 60 softgels.
Solgar: Phosphatidylserine Complex, 100 mg phosphatidylserine, 100 mg phosphatidylcholine from 500 mg phosphatidylserine complex, 30 tablets.

**Phytosterols and Phytostanols**

Related Item: Beta-sitosterol.

Description: Phytosterols are compounds found in plants that have a chemical structure similar to cholesterol.
Cholesterol is found only in animal products, however. Phytostanols are similar to phytosterols, except they have no double bonds in the sterol ring. In other words, phytostanols are saturated phytosterols.

Uses: Phytosterols and phytostanols have been shown to lower cholesterol. Total cholesterol is reduced by about 10 percent, and LDL cholesterol by about 13 percent. Even better, they seem to have no effect on HDL cholesterol, the good cholesterol.

Phytosterols and phytostanols are very insoluble in water, and dissolve poorly in oil. Esterification of these compounds with long-chain fatty acids increases their solubility in oils and fats. This allows the material to be incorporated into food items such as margarine. But the esters are broken down (hydrolyzed) into the free sterols and stanols in the small intestine before absorption.

The exact mechanism of their cholesterol-lowering action is not known for sure, but it is thought they block the absorption of cholesterol from the diet and the reabsorption of endogenous cholesterol from the GI tract.

Studies so far have shown that the phytosterols and phytostanols seem to be equally effective in lowering cholesterol.

Indications: Cholesterol problems, cardiovascular disease.

Dosage: The dose of unesterified phytosterols and phytostanols is approximately 1 gram daily. The product should be taken with meals.

Cautions: There is some concern that supplementing with phytosterols and phytostanols may interfere with the absorption of certain nutrients (carotenoids, vitamin E, and lycopene).

Products:
Arkopharma: Basikol Phytosterols, 800 mg phytosterols from soy, corn, and canola oils, 120 g powder.
Twinlab: Cholesterol Success, 900 mg phytosterols (Reducol) per 2 tablets, 120 tablets.

**Policosanol**

Description: Policosanol is a term used to describe a group of long-chain, aliphatic, saturated alcohols. They are derived from waxes in plants such as sugar cane, yams, and beeswax. The main alcohol in policosanol is octacosanol.

Uses: Both animal and human studies have shown that policosanol is a safe and effective cholesterol-lowering agent. Results so far have been impressive, with reductions in LDL cholesterol of 20 to 25 percent. HDL cholesterol was increased. In addition, policosanol seems to reduce platelet aggregation almost as effectively as aspirin, especially at higher dosages.

Some have claimed that policosanol, and its main constituent, octacosanol, can boost energy, athletic performance, and male sexual performance. This is an outgrowth of work done back in the early 1970s by Cureton, using an extract of wheat germ oil. Unfortunately, in over thirty years, no research has been produced to substantiate these early claims.

Indications: Cholesterol problems, intermittent claudication.

Dosage: The suggested dose seems to be 5 milligrams, taken once or twice a day with lunch and dinner. It may take several months for the results to appear. Long-term use, at dosages up to 20 milligrams daily, seem to be safe.

Products:
Jarrow: Policosanols, 10 mg, 10 mg policosanols, derived from 36 mg rice bran wax (28%), 100 vegicaps.
Metagenics: Cholarest, 10 mg policosanol from beeswax, 30 softgels.
Pharmanex: Cholestin, 15 mg policosanol from beeswax, 30 softgels.

**Polyphenols**

Related Items: Red wine, green tea, flavonoids.
Description: Polyphenols is a broad term encompassing over 4,000 individual compounds found in plants. It includes the flavonoids, tannins, proanthocyanidins, isoflavones, and catechins.

Uses: Epidemiological studies have shown that both tea consumption and the moderate intake of red wine are inversely related to the risk of heart disease. Both red wine and tea are rich in polyphenols. While the exact mechanism by which wine or tea consumption could offer protection against atherosclerosis and ischemic heart disease is still under investigation, a large body of literature suggests that the presence of polyphenols in these beverages may account for the protective action.

The polyphenols in wine include phenolic acids, anthocyanins, tannins, caffeic acid, rutin, catechin, myricetin, quercetin, and epicatechin. Proanthocyanidins, polymers or oligomers of catechin units, are the major polyphenols in red wine and grape seeds. Resveratrol is a nonflavonoid polyphenol also found in red wine and grape seeds.

The polyphenols in tea include quercetin, kaempferol, myricetin, catechin, epicatechin, and epigallocatechin (ECG).

The polyphenols in general have potent antioxidant activity. Many studies have shown that they may lower total cholesterol, lower LDL cholesterol, and raise HDL cholesterol. They reduce platelet aggregation and have vasorelaxant effects.

Polyphenols are available in many types of supplements, from green tea and grape seed concentrates, to various flavonoid-rich mixed fruit and vegetable concentrates.

Indications: Cardiovascular disease, cholesterol problems, cancer.

Dosage: Follow the directions on the label.

Products:
- Jarrow: Resveratrol Synergy, polyphenols from resveratrol, grapeskin, grape seed, and green tea extracts, plus catechins, anthocyanins, and proanthocyanins, 60 tablets.

Potassium

Description: Potassium is an essential mineral. In conjunction with sodium and chloride, it is involved with regulation of water balance, acidity, blood pressure, and neuromuscular function.

Uses: The largest source of dietary potassium is fruits and vegetables. Many of us eat far too few fruits and vegetables and, at the same time, ingest too much sodium and chloride from processed foods. Many believe this is a cause of high blood pressure.

There is evidence that potassium may be useful in the prevention and treatment of hypertension. This may be most pronounced in male African Americans. Potassium may be beneficial in alleviating other cardiovascular problems as well, including the risk of strokes.

Somewhat paradoxically, the amount of potassium in a dietary supplement is limited to 99 milligrams. This is due to concerns over possible side effects, such as stomach irritation. But one banana can contain 500 milligrams of potassium. One-sixth teaspoonful of popular salt substitutes contain 530 milligrams. Prescription potassium products are widely used in dosages ranging from 1.5 to 3.0 grams daily. (Prescription potassium supplements are usually labeled in mEq, or milliequivalents, not milligrams.)

These higher amounts of potassium, when from food, do not cause stomach irritation. And there is much to be said for eating a piece of fruit rather than taking a potassium tablet.

If you suspect that potassium supplementation might be worth considering, you should discuss it with your physician.

Indications: Hypertension, cardiovascular disease.

Products:
- Twinlab: Potassium Capsules, 99 mg potassium from potassium citrate and potassium aspartate, 180 capsules.
- Solgar: Potassium Amino Acid Complex, 99 mg potassium as potassium glycinate amino acid complex,
250 tablets.

### Pregnenolone

**Related Item:** DHEA.

**Description:** Pregnenolone is naturally found in the body, and serves as a precursor for the synthesis of various steroid hormones, including DHEA (dehydroepiandrosterone) and progesterone.

**Uses:** There are many interesting areas of research on pregnenolone, but it is difficult to justify its use as a nutritional supplement at this time except under medical supervision. It may be shown to have some effect as a memory enhancer, and it may someday be used in treating Alzheimer’s disease, cancer, arthritis, and other conditions associated with aging.

**Cautions:** Pregnenolone should not be used by those with prostate, breast, or uterine cancer. It should not be used by those with seizure disorders.

**Products:**
- Jarrow: Pregnenolone, 50 mg, pharmaceutical grade, 100 capsules.
- Country Life: Pregnenolone, 10 mg, 60 capsules.
- Allergy Research: Pregnenolone, 150 mg TR, 150 mg pregnenolone in a timed-release lipid matrix, 60 tablets.

### Proanthocyanidins

See Grape Seed Extract.

### Probiotics

**Related Item:** Acidophilus.

**Description:** The term probiotic is used to describe live microorganisms that, when ingested, improve the balance of the intestinal microflora, with resultant beneficial health effects. The types of microorganisms commonly used include various lactobacillus species, bifidobacterium species, and yeasts.

**Uses:** A delicate balance and symbiosis exists between the intestinal microflora and the human host. The beneficial bacteria that reside in the intestinal tract have been shown to exert antimicrobial, immunomodulatory, anticarcinogenic, anti-allergenic, and antidiarrheal activity.

When present in adequate quantities, these beneficial microorganisms reinforce the function of the intestinal mucosa as a barrier against pathogens and toxins. Some probiotic organisms have actually been found to secrete antimicrobial substances. Some have been shown to stimulate general immune system function and inhibit, perhaps indirectly, certain types of tumor formation.

The lining of the intestines should serve as a barrier, preventing the absorption of food-protein antigens. Antigens are protein fragments that can trigger an allergic reaction. Those who suffer from food allergies and sensitivities may have, to varying degrees, a condition called leaky gut, which allows too many antigens to be absorbed. Probiotics enhance the integrity of the intestinal mucosa, preventing the absorption of these allergens.

Probiotics have long been used to combat antibiotic-induced diarrhea, and they may be helpful in other types of intestinal problems as well, including ulcerative colitis and Crohn’s disease.

There are many types of bacteria and yeasts now being used in probiotic supplements, including bifidobacteria, lactobacilli, lactococci, saccharomyces, streptococcus thermophilus, and enterococci. There are conflicting claims as to the superiority of one type over another, but each has its own slightly unique properties, and the trend seems to be moving toward mixtures containing synergistic blends. There was also concern over whether certain probiotics were dairy-free or contained dairy products. Some feel this concern may have been overblown. Except for
those with a true milk protein allergy (not lactose intolerance, or “sensitivity”), the small amount of dairy residue in a product taken in capsule or partial teaspoon quantities is not always likely to be a problem.

Another problem with probiotic supplements is stability. First, the organisms themselves are delicate, and careful processing and storage are necessary to ensure their continued viability. Newer technology seems to be overcoming the need for refrigerated storage in this regard. Second, the live organisms have to survive the passage through the gastrointestinal tract before reaching the colon. To ensure that a large enough number of live organisms survive, various measures can be taken, including enteric coating and buffering. Some loss is inevitable, and this is why it is important to start with as high a potency product as possible.

Indications: Diarrhea, candidiasis, immune system, gastrointestinal disorders, allergies (food).

Dosage: Follow the directions on the label. To enhance the survival of the probiotic organisms in the acid environment of the stomach and the alkaline environment of the duodenum, some suggest taking them before meals or on an empty stomach. Others suggest taking them with meals. We suggest that, for the first few days, you do both. Then, take them with meals.

Products:
- Natren: Healthy Trinity, 5 billion Lactobacillus Acidophilus, 20 billion Bifidobacterium Bifidum, 5 billion Lactobacillus Bulgaricus in a special matrix, 30 capsules. Store below 75°F.
- Jarrow: Jarro-dophilus EPS, 4.4 billion total bacilli from 8 different species, enteric coated, 60 vegicaps. No refrigeration required.
- Nature’s Way: Primadophilus Reuteri, 100 million colony-forming units per capsule, enteric coated, 30 capsules.
- Allergy Research: Lactobacillus GG Culturelle, 40 mg Lactobacillus GG delivers 20 billion live/active bacteria, 30 capsules.

Propolis

Description: Propolis is a brownish resinous, glue-like material collected by bees from plant buds and used to seal their hives. It is thought to exert an antimicrobial action, keeping the hives free of germs.

Uses: Propolis has a long history of use in the health food industry, mostly based on its broad antimicrobial and anti-inflammatory action. There is some speculation that propolis, owing to its content of caffeic acid phenethyl ester (CAPE), may have anticancer activity as well.

Indications: Immune system, arthritis.

Dosage: Follow the directions on the label.

Products:
- Nature’s Answer: Propolis, 2,000 mg propolis resin extract, providing 400 mg propolis solids per 2 ml, 1 oz liquid.
- Premier One: Bee Propolis, 650 mg bee propolis 2X (1,300 mg propolis) per 2 capsules, 60 capsules.

PSK

See Coriolus Versicolor Extract.

Psyllium Seed

Related Item: Fiber.

Description: Psyllium (Plantago ovata) is an annual plant native to India and Iran, but now cultivated in many countries, including southern Europe and the United States. It is also known as plantain and Ispaghula. Both the seed and seed husk are used in supplements.
Uses: Psyllium is recognized by the FDA, along with oats, as being effective in lowering cholesterol and LDL cholesterol. It is also helpful in treating constipation, and may be beneficial to those with diabetes in moderating blood glucose levels.

Indications: Cholesterol problems, constipation, diarrhea, irritable bowel syndrome, weight loss, diabetes.

Dosage: Typical dosage is from 5 to 15 grams daily, before meals or at bedtime.

Cautions: If you are not accustomed to supplementing with dietary fiber, be sure to start out with small doses and gradually increase the amount. Always drink ample quantities of water when taking fiber supplements.

Products:
- Yerba Prima: Psyllium Husk Vegicaps, 625 mg psyllium per cap. 4 vegicaps provide 2.2 g fiber, 180 vegicaps.
- Yerba Prima: Psyllium Whole Husks, 4.5 g fiber per tablespoon, 12 oz powder.

### Pycnogenol®

Related Items: Grape seed extract, OPC, PCO.

Description: Pycnogenol® is a name that originally was used to describe the class of flavonoids called proanthocyanidins or procyanidins. Now, it has been trademarked, and refers to procyanidins derived from the French maritime pine (Pinus maritimea).

Uses: OPCs represent a type of flavonoid thought to function as a powerful antioxidant, protecting tissues, glands, and organs throughout the body from the deleterious effects of free-radical damage. In addition, they have an ability to strengthen collagen. This explains their value in enhancing the integrity of skin, blood vessels, and connective tissue. They exert an anti-inflammatory action, perhaps by inhibiting the release of pro-inflammatory prostaglandins. There is also compelling evidence that the proanthocyanidins have anticarcinogenic activity.

Products containing OPC flavonoids are considered by many to be the most valuable and inclusive antioxidants available, and should be part of any comprehensive supplement program.

Products:
- Country Life: Pycnogenol®, 50 mg, 100% pine bark extract (85-90% total polyphenols), 50 capsules.
- Solgar: Pycnogenol®, 100 mg, 100 mg Pycnogenol® extract (95% phenolic components), 30 vegicaps.

### Pygeum

Description: Pygeum (Pygeum africanum) is an evergreen tree native to Africa. The bark of the tree trunk is the part used medicinally, containing phytosterols, including beta-sitosterol, pentacyclic terpenes, and ferulic esters.

Uses: While saw palmetto seems to be slightly better than pygeum in the treatment of benign prostatic hyperplasia, pygeum also appears to be effective. It certainly deserves consideration as an alternative to saw palmetto, or as part of a combination therapy approach.

Indications: Benign prostatic hypertrophy, prostatitis.

Dosage: The usual dose is 50 to 100 milligrams two times a day.

Products:
- Gaia Herbs: Pygeum Africanum Bark, 90 mg Pygeum africanum bark extract per 40 drops, 1 oz liquid.
- Nature’s Herbs: Pygeum Power, 50 mg Pygeum bark extract (13% sterols) per softgel, 60 softgels.

### Pyridoxal 5’-Phosphate

Related Item: Vitamin B6.

Description: Vitamin B6 is an important vitamin, functioning as a coenzyme in the metabolism of amino acids, glycogen, and structural components of the nervous system, as well as neurotransmitters such as serotonin and
dopamine.

Uses: Pyridoxal 5’-phosphate is marketed as a “more absorbable” form of vitamin B6. But vitamin B6 is very readily absorbed, and before pyridoxal 5’-phosphate can be absorbed, it is converted first to pyridoxine. In general, therefore, the regular form of pyridoxine is probably no less effective than the 5’-phosphate.

Cautions: Vitamin B6 is used as a treatment for various peripheral neuropathies. At very high doses—2,000 to 5,000 milligrams daily—over time, it may actually cause sensory neuropathy. It is now agreed that at levels between 200 and 500 milligrams daily, side effects are not likely to occur. During pregnancy, amounts over 100 milligrams daily should be avoided, unless taken under the advice of a health professional.

Products:
- Klaire Labs: Pyridoxal 5’-Phosphate, 50 mg per, capsules, 250 kosher gelatin capsules.
- Source Naturals: Coenzymatated B6, 25 mg B6 from pyridoxal 5’-phosphate (sublingual), 60 tablets.

Pyridoxine

Related Item: Pyridoxal 5’-phosphate.

Description: Vitamin B6 is an important vitamin, functioning as a coenzyme in the metabolism of amino acids, glycogen, and structural components of the nervous system, as well as neurotransmitters (serotonin, dopamine, etc.).

Uses: Supplementation with vitamin B6 is necessary to prevent deficiency, especially in the elderly and the chronically ill. Studies have shown that up to one-third of the healthy elderly population suffers from marginal vitamin B6 deficiency.

Vitamin B6 is important for immune system function. In the elderly, supplementation with vitamin B6 results in significant improvement in immune system function.

In conjunction with vitamin B12 and folic acid, vitamin B6 is important in lowering elevated homocysteine, a risk factor for atherosclerosis.

Vitamin B6 has been shown in several studies to be an effective treatment in some cases of carpal tunnel syndrome. It certainly is something that should be tried before more expensive and invasive treatments are undertaken.

Indications: Carpal tunnel syndrome, cardiovascular disease, autism, nausea (morning sickness), depression (oral contraceptives, PMS), premenstrual syndrome, immune system, asthma.

Dosage: The recommended daily value is 2 milligrams. The amount used in nutritional supplements can run up to 75 milligrams per day or more. When treating carpal tunnel syndrome, up to 200 milligrams per day are usually used. When used for premenstrual syndrome, up to 100 milligrams per day are used.

Since vitamin B6 is a water-soluble vitamin, we recommend that it be taken in divided doses, two or three times a day.

There are two forms of vitamin B6 used in supplements, pyridoxine HC1, and pyridoxal 5’-phosphate. Pyridoxine HC1, the regular form of vitamin B6, is very well absorbed, even in high dosages. Any advantage gained by using the pyridoxal 5’-phosphate is problematic.

Cautions: Vitamin B6 is used as a treatment for various peripheral neuropathies. At very high doses—2,000 to 5,000 milligrams daily over time—it may actually cause sensory neuropathy. It is now agreed that at levels between 200 and 500 milligrams daily, side effects are not likely to occur. During pregnancy, amounts over 100 milligrams daily should be avoided, unless under the advice of a health professional.

Products:
- Solgar: B6, 500 mg, vegetarian and kosher, 100 vegicaps.
- Twinlab: B6, 50 mg, 100 capsules.
Pyruvate

Description: Pyruvate is the salt (anionic) form of pyruvic acid, a key metabolite formed when carbohydrates and proteins are converted in the body to energy. Pyruvate itself can be thought of as a biological fuel source.

Uses: Studies have shown that when pyruvate is taken in amounts ranging from 6 to 50 grams a day and combined with a controlled-calorie diet and/or regular exercise, it aids weight loss and improves cholesterol and triglyceride levels. There is no evidence, however, that taking large doses of pyruvate without concomitant calorie restriction and/or a regular exercise program results in significant weight loss.

Indications: Obesity, weight loss, athletic performance.

Dosage: A level of at least 5 or 6 grams daily seems to be required for weight loss. Higher doses may be necessary for enhancing athletic endurance and performance.

Products:
- Twinlab: Pyruvate Fuel, 750 mg calcium pyruvate, 60 capsules.
- Natrol: Pyruvate 650 mg, 650 mg calcium pyruvate, equal to 528 mg pyruvate, plus 50 mg cayenne pepper, 60 capsules.

Quercetin

Related Items: Bioflavonoids, polyphenols.

Description: Quercetin is a flavonol type of flavonoid, a type of polyphenol. It is found in relatively high levels in onions, green tea, red wine, and apples.

Uses: Quercetin is a strong antioxidant, with anti-inflammatory, anti-allergy, antiviral, immunomodulatory, anticancer, and gastro-protective activity. It enjoys a well-earned reputation as one of the premier antioxidant flavonoid compounds. It may be especially valuable to diabetics, preventing the nerve, eye, and kidney damage common to the condition. It may help fight allergies owing to an antihistamine-type action. And it may even offer some protection against breast cancer owing to its possible antiestrogenic activity.

Indications: Cardiovascular disease, prostatitis, allergies, asthma, cataracts.

Dosage: The usual dosage ranges from 200 to 1,200 milligrams daily.

Products:
- Jarrow: Quercetin 500 mg, from eucalyptus, 200 capsules.

Red Yeast Rice

Description: Red yeast rice is the fermentation product obtained when certain strains of yeast (Monascus purpureus) grow on rice. It has been used for hundreds of years in China as a food and medicine. It has been shown to contain a compound (HMG-CoA reductase inhibitor) that inhibits the production of cholesterol in the liver. The drug lovastatin (Mevacor) contains the same material. This has caused the FDA to challenge the legal status of red yeast rice. They claim it should be regulated as a drug, not a food.

Uses: Red yeast rice has been shown to lower cholesterol and triglycerides. Its action, in certain respects, was superior to the drug lovastatin, and may indicate that there are other active ingredients in red yeast rice that contribute to its action. But the product may no longer be available as a supplement owing to ongoing regulatory problems.

Indications: Cholesterol problems.

Dosage: At the time this was written, the continued availability of this product is uncertain.

Cautions: If available, all of the warnings and cautions appropriate to the use of lovastatin-type drugs would apply to this product.
Reishi

Related Item: Medicinal mushroom.
Description: Reishi mushrooms grow on decaying logs and stumps in the coastal regions of China. The red variety is most often used, and is cultivated throughout the Orient and North America.
Uses: Certain mushrooms have been shown to have immunomodulatory Indications: Immune system, hypertension, diabetes activity, as well as possible antitumor, antimicrobial, lipid-lowering and glucose-regulating actions. The components thought to be responsible for this are polysaccharide complexes found in the cell walls of the organism. The active constituent is beta-D-glucan, or beta-glucans.
Reishi, in addition, contains triterpenoids (ganoderic acids), which may lower blood pressure and LDL cholesterol. Reishi may be of some benefit to those with diabetes as well.
Dosage: Reishi is available in powder, tea, and tincture form. Follow the directions on the label.
Products:
Nature’s Herbs: Reishi Power, 60 mg Reishi mushroom extract, providing 4% triterpenoids and 12.5% polysaccharides, and 540 mg Reishi mushroom powder, 60 capsules.
Maitake Products: Super Reishi, 500 mg reishi fruit body, 300 mg reishi 14:1 extract, plus ginger, maitake D fraction, vitamin C, and bioperine per 4 vegetable tablets, 120 tablets.
Nature’s Answer: Reishi Alcohol Free, 1,000 mg reishi fruiting body fluid extract per ml, 1 oz liquid.

Resveratrol

Description: Resveratrol is a nonflavonoid polyphenol found in grape skin and red wine. It can also be found in the dried roots and stems of the plant Polygonum cuspidatum.
Uses: Resveratrol has been shown to be an antioxidant with cardioprotective action. It is thought to be of value as an anti-atherosclerotic agent, and may also have immune-stimulating and anticancer activity.
Indications: Cardiovascular disease, cholesterol problems, immune system.
Dosage: Follow the directions on the label.
Products:
Natrol: Resveratrol, 50 mg, 12 mg total resveratrol from 50 mg Polygonum cuspidatum root extract, 60 capsules.
Source Naturals: Resveratrol, 10 mg resveratrol from 500 mg Polygonum cuspidatum (8% total resveratrols), 60 tablets.
Seagate Gold: Grape Seed Extract, 250 mg, 150 mg red grape seed extract, 100 mg red grape skin extract, 90 capsules. Note that this product contains not only an extract of the grape skin, but also an extract of grape seed. (See Grape Seed Extract.)

Riboflavin

Description: Riboflavin (vitamin B2) plays a key role in energy production and the generation of antioxidants such as glutathione.
Uses: Recent research indicates that high-dose supplementation with riboflavin may prevent migraine headaches. It may also protect against esophageal cancer, malaria, and cataracts.
Indications: Migraine headaches, nutritional support (elderly), canker sores.
Dosage: The recommended daily allowance is 1.7 milligrams, but supplements normally contain from 25 to 50
milligrams. For treatment of migraine headaches, doses as high as 400 milligrams daily may be used. This should be done under the supervision of a health professional.

Cautions: Riboflavin has a greenish-yellow fluorescent color. Excess riboflavin is excreted in the urine and imparts this color to the urine. This is of no consequence.

Products:
- Twinlab: B2, 100 mg, 100 mg riboflavin from riboflavin 5’-phosphate and riboflavin, 100 capsules.

**Rose Hip Vitamin C**

Related Items: Vitamin C.
Description: Rose hips is the fruit of the rose plant. It is a very rich source of vitamin C.
Uses: A concentrate or extract of rose hips can be used in supplements as a source of “natural” vitamin C. Although “natural” vitamin C is no different from “synthetic” vitamin C, there are other substances in rose hips (flavonoids, carotenoids, other vitamins, minerals) that offer additional benefit.
Just as it is desirable to take vitamin C with bioflavonoids rather than vitamin C alone, it may be of some benefit to take vitamin C either from rose hips or with rose hip concentrate.
Be careful not to be misled about what is actually in the product. If it is a high-potency vitamin C supplement, it is unlikely to be providing vitamin C only from rose hips. Instead, it is more likely a mixture of rose hip—derived vitamin C and synthetic vitamin C.
Read the label carefully. Products that used to be labeled “Rose Hip C, 500 mg” some years ago now call themselves “Vitamin C 500 mg with Rose Hips.” The content of the product did not change, but the wording on the label did! If a product is labeled in such a way to imply that it contains 500 or 1,000 milligrams of Vitamin C “from rose hips,” we suggest you move on to another brand.
Products:
- Solgar: Vitamin C, 1,000 with Rose Hips, 62.5 mg rose hips fruit, 1,000 mg L-ascorbic acid, 100 tablets.

**Rosemary Leaf**

Description: Rosemary (Rosmarinus officinalis) is a small, fragrant evergreen shrub native to the Mediterranean but now found cultivated throughout the world. Rosemary contains phenolic acids, phenolic diterpenoid bitter substances, triterpenoid acids, flavonoids, volatile oils, and tannins.
Uses: Rosemary has been used medicinally since the time of the Greeks. In Europe, it has been used as a tonic, stimulant, and carminative to treat dyspepsia (indigestion), headaches, and nervous tension. A carminative is an agent that helps to expel gas, relieving colic and cramping. It is used as a spasmolytic, to relieve intestinal cramping, and as a choleretic, promoting bile secretion by the liver.
The volatile oils in rosemary are thought to have powerful antibacterial action. There is some evidence that certain of the components in rosemary have anticancer activity as well.
Indications: Indigestion, gastrointestinal disorders, candidiasis, immune system, headaches.
Dosage: One or two capsules of standardized extract, two or three times daily. Or up to 10 milliliters of the tincture, two or three times daily.
Products:
- Gaia Herbs: Rosemary Leaf, 1 oz liquid.
- Arkopharma: Rosemary, 300 mg, 300 mg rosemary flower head powder (1.5% essential oil), 100 capsules.
- Natrol: RoseOx, 250 mg, 250 mg rosemary leaf powdered extract, 30 capsules.
**Royal Jelly**

Description: Royal jelly is the substance secreted by nurse worker bees that stimulates the growth and development of the queen bee. Without this substance, the queen bee would apparently be no different from a worker bee, living for only seven or eight weeks rather than five to seven years.

Uses: While royal jelly has not yet been shown to increase the life span of humans tenfold, as it does for the queen bee, it does seem to have some beneficial effects as a supplement. Studies have shown that royal jelly may have cholesterol-lowering activity. There is also some evidence that it may have some antibacterial, immune system stimulating, and anti-inflammatory action.

Indications: Cholesterol problems.

Dosage: The usual dose is from 50 to 100 milligrams daily.

Cautions: Those with allergies and sensitivities should exert caution.

Products:
- Premier One: Royal Jelly 1000, 286 mg royal jelly 3.5X, equivalent to 1,000 mg royal jelly, 60 capsules.

**Rutin**

Related Items: Bioflavonoids, quercetin.

Description: Rutin is a flavonoid, commonly present in the “citrus bioflavonoid” type of supplements. Rutin is the rhamnoglucoside of quercetin; when hydrolyzed, it yields quercetin, rhamnose, and glucose.

Uses: The powerful antioxidant action of the flavonoids protects the membranes of both the red blood cells and the cells lining the capillary walls. This prevents those cells, the endothelial cells, from becoming brittle and damaged. This condition, sometimes called capillary fragility, can lead to poor circulation, easy bruising, varicose veins, spider veins, and hemorrhoids. When fluid leaks from fragile capillaries, swelling and inflammation result. Historically, the flavonoids are associated with vitamin-P activity. Vitamin P was a term originally applied by Albert Szent-Gyorgyi, who discovered vitamin C, because of his observation that this group of compounds reduced capillary permeability. We now feel that the most important biochemical, or therapeutic, action of the flavonoids as a group is their powerful antioxidant activity. Some have referred to them as biological response modifiers due to their anti-inflammatory, antiviral, anticarcinogenic, and anti-allergy properties.

Products:
- Solgar: Rutin, 500 mg, 500 mg rutin from Dimorphandra mollis fruit (Brazilian tree), 250 tablets.

**S-Adenosyl-L-Methionine**

See SAMe.

**SAMe**

Description: S-adenosyl-l-methionine (SAMe) is a substance naturally present in the body. It plays a crucial role in the biochemical reactions involving transmethylation. SAMe is a “methyl donor.” Thus, SAMe is involved in the biosynthesis of DNA, RNA, phospholipids, proteins, melatonin, epinephrine, creatine, and other proteins.

Uses: In Europe, SAMe is categorized as a drug, and is recommended for the treatment of depression, liver disorders, osteoarthritis, and fibromyalgia. In the United States, it is being used to support emotional well-being and enhance mood, in addition to treating mild to moderate depression. It is also used to treat joint problems and osteoarthritis. It may be useful in certain liver disorders as well.

Unlike traditional antidepressants, SAMe has few side effects, and a more rapid onset of action—only one or two weeks.
SAMe is generally unstable, and various measures are used to overcome this problem. Various modified forms are available, as is the use of an enteric coating. Even the enteric-coated forms are subject to deterioration from moisture and temperature, so it is important that moisture-resistant packaging is used and careful storage requirements are adhered to.

Many suggest taking SAMe with additional vitamin B6, B12, folic acid, and perhaps trimethylglycine, to assist in controlling the levels of homocysteine, the end product of SAMe metabolism.

Indications: Depression, arthritis (osteo), fibromyalgia, liver disorders.

Dosage: For joint problems and osteoarthritis, the dosage ranges between 400 and 1,200 milligrams daily. For depression, from 800 to 1,600 milligrams can be used. Always take the product on an empty stomach (one hour before or two hours after meals).

Read the label carefully to determine if you are getting 200 milligrams of SAMe or SAMe tosylate disulfate.

Cautions: There is some question as to whether SAMe is beneficial or detrimental to those with Parkinson’s disease.

Products:
Jarrow: SAMe 200 mg Enteric Coated, 200 mg SAMe from 400 mg SAMe tosylate disulfate, 60 tablets.
Take on an empty stomach.

Saw Palmetto

Description: Saw palmetto (Serenoa repens) is a small palm tree native to southeastern North America. The fruits, or berries, were used as a staple food and medicine by the Seminole inhabitants of Florida before European colonization.

Uses: Saw palmetto, particularly the fat-soluble (lipophilic) extract, has been shown, very convincingly, to be as good or better in treating benign prostatic hyperplasia than the popular prescription medication (finasteride). At the very least, saw palmetto is as effective as the drugs, but with significantly lower incidence of side effects.

The role of saw palmetto in preventing prostate cancer is still being investigated. Most recent evidence now indicates that, contrary to early thinking, saw palmetto actually results in a reduction of the enlargement of the prostate. Also, it is reported that saw palmetto does not interfere with PSA measurements.

Indications: Benign prostatic hypertrophy.

Dosage: Typically, 160 milligrams of the lipophlic extract, twice daily. One 320-milligram capsule daily may work as well. Allow four to six weeks for effects to fully manifest themselves.

Products:
Nature’s Way: ProstActive, 320 mg saw palmetto berry extract (12:1), 30 softgels.
Nature’s Herbs: Saw Palmetto, 600 mg saw palmetto berry powder, 100 capsules.
Nature’s Answer: Saw Palmetto Berry, 2,000 mg saw palmetto berry fluid extract per 2 ml (56 drops), 2 oz liquid.

Sea Cucumber

Related Items: Cartilage, shark cartilage, bovine cartilage, green-lipped mussel.

Description: A source of mucopolysaccharides thought to be helpful in reducing the pain and inflammation of arthritis and sports injuries.

Indications: Arthritis, sports injuries.

Products:
Solgar: Sea Cucumber, 500 mg blend of sea cucumber and sea plant, 30 vegicaps.
Nutraceutical Research: Marine Care, 500 mg sea cucumber, 60 capsules.
Selenium

Related Items: Selenium yeast, selenomethionine.

Description: Selenium is an essential trace element. It is a component of the enzyme glutathione peroxidase, a powerful antioxidant.

Uses: Low levels of selenium have been linked to increased risk of cancer, cardiovascular disease, and inflammatory disorders. Selenium is a powerful antioxidant, working in conjunction with vitamin E to protect against oxidative, free radical damage. Selenium is important for proper immune system function, and may play a role in detoxification and male fertility.

In certain areas, the soil is low in selenium, resulting in widespread selenium deficiency. Plants (crops) can be low in selenium even though they look normal.

The importance of selenium in reducing the incidence of certain cancers (prostate, lung, colorectal, and skin) is well documented and impressive. There is strong epidemiological evidence of a similar role for selenium in reducing the risk of cardiovascular disease.

There is some evidence that selenium levels are also inversely related to cataract formation. Glutathione peroxidase, a major antioxidant enzyme in the eye, is selenium dependent.

In the light of the overwhelming evidence supporting the benefit of ensuring an optimal level of selenium intake, it is difficult to understand why anyone interested in living a long and healthy life would not supplement with this trace mineral.

Indications: Cancer, cardiovascular disease, immune system, HIV, cataracts.

Dosage: The currently accepted range of selenium in supplements is between 50 and 200 micrograms daily, with doses up to 400 micrograms being used by those with cancer, heart disease, or otherwise at risk to conditions influenced by selenium. The tolerable upper limit is 400 micrograms. Adverse effects are rarely seen at dosages below 900 micrograms daily.

There are three types of selenium supplements available. There is a selenium-enriched brewer’s-type yeast that is an excellent source of selenium. Another “organic” form is selenomethionine. The active form of selenium in the body (and in the yeast supplement) is actually this same selenomethionine compound. It is an excellent source. For those who prefer not to ingest yeast, selenomethionine is fine. For those who do not like the natural sulfur odor of the selenomethionine, the yeast form is fine. In fact, studies show that the inorganic forms of selenium, sodium selenite and sodium selenate, while not as good as the organic forms, are sufficiently well absorbed to be used without concern for availability.

For most individuals, the 200 micrograms of selenium contained in a balanced daily multivitamin-multimineral supplement will be all that are needed. Usually, a comprehensive antioxidant blend will contain additional selenium and vitamin E. So the combination of a balanced multivitamin and an antioxidant blend may provide ample amounts of selenium.

Products:
- Twinlab: Sodium Selenite, 250 mcg selenium from sodium selenite, yeast-free, 100 capsules.

Selenium Yeast

Related Item: Selenium.

Description: Selenium-enriched yeast has been grown in a selenium-rich media so that it incorporates higher than normal levels of selenium. On enzymatic hydrolysis, the selenomethionine complex is released, which is then readily absorbed from the small intestine.

Uses: Low levels of selenium have been linked to increased risk of cancer, cardiovascular disease, and inflammatory disorders. Selenium is a powerful antioxidant, working in conjunction with vitamin E to protect against oxidative, free-radical damage. Selenium is important for proper immune system function and may play a role in...
detoxification and male fertility.

The importance of selenium in reducing the incidence of certain cancers (prostate, lung, colorectal, and skin) is well documented and impressive. There is strong epidemiological evidence of a similar role for selenium in reducing the risk of cardiovascular disease.

Some evidence exists that selenium levels are also inversely related to cataract formation. Glutathione peroxidase, a major antioxidant enzyme in the eye, is selenium-dependent.

This form of supplemental selenium is very well utilized by the body.

Cautions: For those with yeast sensitivities, the selenomethionine form or the inorganic forms of selenium can be used.

Products:
- Country Life: Selenium, 100 mcg, 100 mcg selenium as high-selenium yeast, 100 tablets.
- Solgar: Selenium 200 mcg, 200 mcg selenium as primary grown yeast, 100 tablets.

Selenomethionine

Related Item: Selenium.

Description: L-selenomethionine is a compound containing selenium and an amino acid, methionine. This form of selenium is readily absorbed from the small intestine.

Uses: Low levels of selenium have been linked to increased risk of cancer, cardiovascular disease, and inflammatory disorders. Selenium is a powerful antioxidant, working in conjunction with vitamin E to protect against oxidative, free-radical damage. Selenium is important for proper immune system function and may play a role in detoxification and male fertility.

The importance of selenium in reducing the incidence of certain cancers (prostate, lung, colorectal, and skin) is well documented and impressive. There is strong epidemiological evidence of a similar role for selenium in reducing the risk of cardiovascular disease.

Some evidence exists that selenium levels are also inversely related to cataract formation. Glutathione peroxidase, a major antioxidant enzyme in the eye, is selenium-dependent.

This form of supplemental selenium is very well utilized by the body.

Cautions: Methionine is a sulfur-containing amino acid, and may have a slight sulfurous odor. This is normal.

Products:
- Solgar: Seleno-6, 100 mcg, vegetarian and kosher, 250 tablets.
- Klaire Labs: Seleno Met, 200 mcg, 100 capsules.

Shark Cartilage

Related Items: Cartilage, bovine cartilage.

Description: In general terms, cartilage is composed of collagen and proteoglycans, which in turn contain glycosaminoglycans (GAGs) or mucopolysaccharides, which in turn contain chondroitin sulfate, which in turn contains glucosamine. There is considerable argument and debate in the nutritional-supplement industry over which of the forms of cartilage—shark cartilage, bovine cartilage, glucosamine sulfate, chondroitin sulfate, or another mucopolysaccharide-rich substance such as green-lipped mussel extract or sea cucumber—is most effective. There is no clear answer, as there is some degree of support for each argument, and there is clinical evidence supporting the efficacy for each supplement.

Uses: The primary use for these supplements, in general, is to rebuild damaged connective tissue and joints, reduce inflammation, and relieve the pain associated with osteoarthritis and sports injuries.

Cartilage supplements, however, especially shark cartilage, have historically been used for a different purpose—as a treatment for certain forms of cancer. The basis for the use of cartilage in treating cancer was that it was
thought to inhibit the formation of new blood vessels (angiogenesis). In spite of early enthusiasm in this area, follow-up research in support of this use has not been forthcoming.

It is difficult to assign a specific use for shark-cartilage supplements today. Rich in the minerals and protein building blocks of bone and connective tissue, they certainly could be part of any supplement regimen for arthritis or osteoporosis. But as a primary treatment for a condition such as arthritis, one would have to wonder if glucosamine sulfate and/or chondroitin sulfate should take precedence. For cancer, the advice of a qualified health professional should be sought out, to determine whether or not cartilage treatment is appropriate.

Dosage: For cancer, extremely large doses were utilized. For arthritis, in support of other supplements, up to 2 grams a day are sufficient.

Products:
Seagate: Shark Cartilage, 650 mg, 100 capsules.
Lane Labs: Benefin Caplets, 750 mg shark cartilage per caplet, 270 caplets.

Shark Liver Oil
See Alkylglycerol.

Shiitake Mushroom

Related Item: Medicinal mushroom.
Description: Originally native to Japan, China, and other Asian countries, shiitake mushroom (Lentinus edodes) is now widely cultivated throughout the world. It normally grows on fallen broadleaf trees.
Uses: Certain mushrooms have been shown to have immunomodulatory activity, as well as possible antitumor, antimicrobial, lipid-lowering, and glucose-regulating actions. The components thought to be responsible for this are polysaccharide complexes found in the cell walls of the organism. The active constituent is beta-D-glucan, or beta-glucans.

Shiitake contains a unique polysaccharide called lentinan. A preparation of the powdered mycelium is called lentinus edodes mycelium extract, or LEM. A purified version is available in Japan as a treatment for cancer.

There are many interesting studies supporting the efficacy of shiitake mushroom extracts, including one that showed that the recurrence rate of genital warts was reduced significantly in those who took a lentinan supplement.

Indications: Immune system, HIV, liver disorders, cancer (prostate).
Dosage: Shiitake is available as a food, and as a concentrate. The dose of the concentrate is 1 to 3 grams, two or three times daily.

Products:
Nature’s Answer: Shiitake Alcohol Free, 2,000 mg shiitake fruiting body fluid Extract per 2 ml, 1 oz liquid.
Nature’s Herbs: Shiitake Mushroom, 600 mg shiitake mushroom powder per capsule, 100 capsules.

Siberian Ginseng

Related Item: Ginseng.
Description: Siberian ginseng (Eleutherococcus senticosus) is technically not a ginseng, and it is not from Siberia. It is a separate species, also known as Eleuthero or, in China, as Ci Wu Jia.
Uses: The German Commission E approves Siberian ginseng as a tonic in times of fatigue and debility, declining capacity for work or concentration, and during convalescence.

There have been, according to some reports, over 1,000 scientific studies on Siberian ginseng. Most of them were in Russia, and many do not meet today’s rigid standards. But the general consensus regarding its value has
to be compelling, especially when taken in context of its persistent popularity.

The term adaptogen was coined by Soviet researchers to describe Siberian ginseng’s ability to increase nonspecific resistance, help modulate stress, and improve performance under stressful conditions.

Siberian ginseng has been shown to indeed demonstrate the qualities originally designated as adaptogenic. Its use seems to improve endurance, memory, and stamina. It has immunomodulating and immunostimulatory action. There is some evidence that it has hypoglycemic activity, platelet aggregation–inhibiting action, and antiproliferative effects on leukemia cells. It may protect the liver from toxins, and has been shown to protect against the effects of radiation. Some interesting research on eye conditions shows that it helps patients with glaucoma, eye burns, and even myopia. In another study, it improved color distinction in people with normal color vision.

Siberian ginseng may help alleviate the side effects and enhance recovery in people undergoing chemotherapy and radiation therapy for cancer.

Indications: Athletic performance, energy (low), chronic fatigue syndrome, stress, immune system, cancer (breast), cold and flu, diabetes.

Dosage: Powdered root and rhizomes, 2 or 3 grams per day. Standardized powdered extracts are available, and 300 to 450 milligrams daily are a common dose. Liquid extracts and tinctures are available as well, and are effective. Follow the dosage recommendations on the label.

Cautions: Commission E cautions against using Siberian ginseng if you have high blood pressure. No one seems to understand why they say this, except that two old Russian studies made that recommendation. However, research indicates that, if anything, Siberian ginseng lowers blood pressure. Other studies have shown that it raises low blood pressure and lowers elevated blood pressure.

Products:
Nature’s Answer: Siberian Ginseng Root Alcohol Free, 2,000 mg Siberian ginseng root fluid extract per 2 ml, 2 oz liquid.
Solgar: Siberian Ginseng Root Extract, 150 mg Siberian ginseng root extract (0.8% eleutherosides), and 300 mg Siberian ginseng root powder, 180 vegicaps.

Silicon

Related Items: Horsetail, orthosilicic acid.

Description: Silicon is the most abundant mineral on earth, and it is now recognized as an essential mineral in humans.

Uses: Silicon appears to be involved in maintaining the integrity of the skin, ligaments, tendon, bone, hair, and nails. Silicon seems to be required for collagen and glycosaminoglycan formation. Claims that silicon may be helpful in preventing atherosclerosis are no doubt related to this function.

The exact role played by silicon is yet to be determined, and evidence for its effectiveness is lacking, but anecdotal support abounds. We have seen impressive improvement in nail and hair strength and growth after silicon supplementation. In Europe, the combination of silicon and herbs such as devil’s claw is a popular and effective treatment for arthritis.

Indications: Hair, skin, and nails, osteoporosis.

Dosage: There is no established dose. Amounts ranging from 2 to 20 milligrams have been used.

Products:
Natureworks: Silica Gel Liquid, 420 mg silica from quartz (silicon dioxide), 17 oz liquid.
Solgar: Oceanic Silica, 25 mg elemental silicon from red algae powder, 100 vegicaps.

Soy Isoflavones

Related Items: Soy protein, ipriflavone.
Soy isoflavones are phytoestrogens, plant-derived non-steroidal compounds that resemble estrogen and demonstrate weak estrogenic and weak anti-estrogenic effects. The three main isoflavones in soy are genistein (50%), diadzein (40%), and glycitein (10%).

Uses: Soy isoflavones may help to prevent, and treat, various types of heart disease and cancer. Studies have shown benefit in breast, lung, and prostate cancer, as well as leukemia. Numerous studies have shown that soy isoflavones can lower cholesterol levels. (See Soy Protein.)

Soy isoflavones, perhaps due to their weak estrogenic activity, seem to alleviate many of the symptoms of menopause, including hot flashes, and may be very valuable in preventing osteoporosis. (See Ipriflavone.)

Studies have shown that long-term soy protein consumption does not affect normal hormone levels in post-menopausal women.

Indications: Cardiovascular disease, cholesterol problems, cancer, osteoporosis, menopause.

Dosage: The optimal dose is still being determined, but between 50 and 125 milligrams of soy isoflavones are commonly employed.

Products:
Twinslab: Mega Soy, 200 mg soy bean extract (40% isoflavones, 80 mg), providing 40 mg genistin, 31 mg diadzin, and 8 mg glycitin, 60 capsules.
Jarrow: Isoflavone 50, 50 mg isoflavonoid complex providing 25 mg genistein, 18 mg diadzein, and 7 mg glycitein, 60 capsules.
Solgar: Super Concentrated Isoflavones, 38 mg total isoflavones from soy isoflavone extract, 120 tablets.

Soy Protein

Description: Soy protein is marketed as soy protein isolate and contains approximately 90 percent protein. Soy protein is a complete protein, but its biological value is not as high as casein, whey, or egg. When fortified with methionine, its biological value can be enhanced to the equivalent of casein. Soy protein is not only a source of dietary amino acids, but also a source of isoflavones, saponins, and bioactive peptides.

Uses: Diets high in soy protein and low in animal protein lead to a decrease in levels of total cholesterol, LDL cholesterol, and triglycerides. The evidence of this is so convincing that the FDA now allows the following label claim: “Diets low in saturated fat and cholesterol that include 25 grams of soy protein a day may reduce the risk of heart disease.”

This beneficial effect on cholesterol and triglycerides seems to be due to a synergistic action of the soy protein, soy isoflavones, and perhaps saponins.

Soy protein isolate can be used as a source of additional dietary protein, necessary for tissue synthesis and repair.

There are other possible benefits associated with the isoflavones in soy protein (See Soy Isoflavones).

Indications: Nutritional support, cholesterol problems, cardiovascular disease.

Products:
Jarrow: Iso-Rich Soy, 25 g protein, 56 mg isoflavones per dose, vanilla flavor, 15.8 oz (449 g).
Nature’s Life: Protein 95, 25 grams protein, 69 mg total isoflavones per scoop, vanilla flavor, 1 lb (450 g).

Spirulina

Related Items: Chlorella, green foods, wheat grass, barley grass, chlorophyll, blue green algae.

Description: Spirulina is a type of unicellular blue green algae, or bacteria, that, in spite of the enthusiastic marketing claims to the contrary, can be grouped along with similar supplements as a green food.

All green-food supplements are relatively rich in protein, chlorophyll, gamma-linolenic acid (GLA) and
Carotenoids.

Uses: Green-food concentrates of this type are claimed to have anticancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents. While convincing proof of all of these actions may be lacking, there is certainly no reason not to include one of the green-food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antioxidants, and varying amounts of trace nutrients. The problem with these supplements is that exaggerated marketing claims often accompany the products, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.

Indications: Immune system, liver disorders, allergies, cholesterol problems, detoxification.

Cautions: Green-food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.

Products:
- Nutrex Hawaii: Spirulina Pacifica, 3 g of protein, plus carotenoids and SOD per teaspoon (5 g), 16 oz powder.
- Solgar: Spirulina, 750 mg, 2 g of protein, plus 14,000 IU beta-carotene per 4 tablets, 250 tablets.

Squalene

See Alkylglycerol.

St. John’s Wort

Description: St. John’s wort is a perennial herb native to Europe, North Africa, and western Asia. Medicinally, the dried aboveground parts are used.

Uses: St. John’s wort is used as a treatment for mild to moderate depression. This is supported by a long history of usage and numerous clinical studies. Conventional medicine and the regulatory agencies are reluctant to acknowledge its efficacy, demanding more scientifically exacting research, but their caution may be inappropriate. It was originally thought that hypericin was the active ingredient in St. John’s wort; however, there is now some question as to whether that is indeed the case.

Indications: Depression, anxiety, seasonal affective disorder.

Dose: The usual dose for mild to moderate depression is 500 to 1,000 milligrams of the extract per day.

Cautions: St. John’s wort is reported to increase the skin’s sensitivity to sunlight. Fair-skinned people should exert caution. People with manic-depressive illness (bipolar disorder) should not take St. John’s wort unless advised otherwise by a physician.

There is also some concern that St. John’s wort may affect the metabolism of certain prescription drugs. It seems that St. John’s wort speeds up the liver’s detoxification functions. In certain respects, this is beneficial. But it may result in an increased rate of drug metabolism, shortening the life of certain medications. The net result is that certain conventional medications may be less effective when taken in conjunction with St. John’s wort. Some examples include contraceptives, HIV medications, and cyclosporine. If you are taking prescription medications, make sure your physician knows that you are also taking St. John’s wort.

Products:
- Nature’s Answer: St. John’s Wort, 1,000 mg St. John’s wort fluid extract per ml, 1 oz liquid.
- Nature’s Way: Perika St. John’s Wort Extract, 300 mg St. John’s wort Extract (WS5572), providing 0.3% hyperformin, 60 tablets.
**Sterols**

Related Items: Plant sterols, phytosterols, beta-sitosterol, stanols.

Description: Sterols are components of plants, with a structure similar to cholesterol. They are very poorly absorbed from the digestive tract (small intestine).

Uses: Sterols have been shown to lower elevated cholesterol levels. This may be due to inhibition of cholesterol absorption. For this purpose, sterol supplements should be taken with meals.

Sterols have also been shown to be an effective treatment for BPH (benign prostatic hyperplasia). In addition, there is some evidence that sterols can normalize immune system function. Specific conditions that this might benefit include viral infections, rheumatoid arthritis, allergies, cancer, autoimmune diseases.

Products:
- Essential Phytosterolins: Moducare, 20 mg plant sterols, 0.2 mg plant sterolins, 90 vegicaps.

**Stinging Nettle**

Description: Stinging nettle (Urtica dioica) is a perennial herb that grows wild throughout the world’s temperate zones. The name comes from the hairs that burn or sting. There are two types of stinging nettle supplements. One type is derived from the root, and the other is derived from the herb and leaf, or the aboveground parts.

Uses: The root is used primarily as a treatment for benign prostatic hyperplasia and prostatitis. The leaf is used as a treatment for arthritis and respiratory allergies and can also function as a diuretic.


Dosage: When treating BPH, 120 milligrams of a concentrated root extract can be taken twice a day. For arthritis, or allergies, take one or two capsules of the leaf concentrate twice a day, or as directed.

Products:
- Nature’s Answer: Nettle Leaf, 2,000 mg nettle leaf fluid extract per 2 ml, 2 oz liquid.
- Solgar: Stinging Nettle Leaf Extract, 275 mg nettle leaf extract, standardized to 0.1% (3 mg) silicic acid, and 200 mg stinging nettle leaf powder, 60 vegicaps.
- Eclectic Institute: Urtica Dioica, 250 mg, 250 mg freeze dried stinging nettle root, 90 capsules.
- Gaia Herbs: Nettle Root, 25 mg organically grown stinging nettle root extract per 30 drops, 2 oz liquid.

**Taurine**

Description: Taurine is a nonprotein amino acid. It is formed in the body as an end product of the metabolism of L-cysteine. It is found in high levels in the brain, retina, and muscle tissue, including heart muscle. Taurine is considered an essential amino acid for infants, and may be necessary for normal retina and brain development.

Uses: Taurine is an antioxidant, and seems to play a role in bile acid production. Taurine has been shown to be of value in treating congestive heart failure, arrhythmias, and possibly hypertension. It has also been shown to be of benefit in cystic fibrosis, reducing the degree of fat malabsorption. There is also a possible role for taurine in treating epileptic seizures.

Indications: Congestive heart failure, cystic fibrosis, epilepsy, liver disorders.

Dosage: The dose can range from 500 to 6,000 milligrams per day.

Products:
- Jarrow: Taurine 1000 mg, pharmaceutical grade, 100 capsules.
- Solgar: Taurine, 500 mg, vegetarian and kosher, 250 vegicaps.
Tea Tree Oil

Description: Tea tree oil (Melaleuca alternifolia) is derived from the leaves of the tree, a tall evergreen that grows in Australia and Asia. The oil contains numerous terpenoids, with terpinen-4-ol used as a standardization marker, required in concentrations not less than 30 percent of the oil. Another compound, cineole, should not be present at levels over 15 percent.

Uses: Tea tree oil seems to be an effective antifungal and antibacterial agent. It has been shown to be effective for conditions such as athlete’s foot, acne, toe nail fungus, and thrush.

Indications: Fungal infections (topical).

Dosage: The full-strength oil (70 percent to 100 percent) can be applied to the affected area twice a day. For acne, a diluted oil is used (around 10 percent). Tea tree oil is available in several premixed forms for various uses (mouthwash, douche, and so forth), and the directions on the container should be followed carefully.

Cautions: Use caution if treating a large area. Test a small amount for sensitivity first. Do not take tea tree oil internally.

Products:
- Desert Essence: Tea Tree Oil, 100%, 2 oz liquid.
- Thursday Plantation: Tea Tree Oil, 100%, minimum 36% terpinen4-ol, 50 ml.

Theanine

Related Item: Green tea extract.

Description: L-theanine is an amino acid found in green tea. It is a derivative of L-glutamic acid, and is thought to be what gives green tea its characteristic flavor.

Uses: Interest in theanine has resulted from research showing that it seems to enhance the activity of some anti-cancer drugs while protecting noncancerous cells from their side effects. When used in conjunction with chemotherapeutic drugs, it may exert a synergistic and protective action.

Theanine also seems to have a mood-modulating, relaxing effect that may indicate some value in treating stress and anxiety.

Indications: Cancer, anxiety.

Products:
- Jarrow: Theanine, 100 mg, 60 capsules.

Thiamine

Description: Thiamine (vitamin B1) plays a role in the metabolism of carbohydrates and other nutrients, providing energy to all cells in the body. It is directly involved with nerve cell function. A deficiency of Vitamin B1 results in the condition known as beriberi. The early stage of beriberi causes fatigue, irritation, poor memory, sleep disturbances, precordial pain, anorexia, abdominal discomfort, and constipation. Later, severe peripheral neurologic symptoms appear, initially in the lower legs. The condition was first characterized when it became popular to “polish” rice, that is, remove the outer husk. This resulted in loss of thiamine, and beriberi resulted.

Uses: Marginal thiamine deficiency may be more common than many realize, especially among the elderly and those with chronic illness. Heavy alcohol consumption is known to cause thiamine deficiency as well. In fact, there was a movement in the past to fortify alcoholic beverages with thiamine to prevent the condition called Wernicke’s encephalopathy.

Because of thiamine’s role in carbohydrate metabolism and nerve cell function, supplementation is often recommended for those with diabetes.

Thiamine works in concert with the other B vitamins, and except in special circumstances, a B-complex mixture
of B vitamins is the preferred means of supplementation.

Indications: Alzheimer’s disease, diabetes, fibromyalgia, chronic fatigue syndrome, nutritional support (elderly), multiple sclerosis.

Dosage: The recommended daily allowance is as little as 1.5 milligrams, but supplements commonly provide from 25 to 75 milligrams daily. For those wanting higher doses, we suggest taking a fifty-milligram dose twice daily, rather than one 100-milligram dose.

Thiamine is usually present in supplements as the hydrochloride or mononitrate. Both forms are stable and well absorbed, although the higher the dose, the lower the percentage absorbed. A fat-soluble form of thiamine, allithiamine is available, and may be better absorbed at high doses. Normally, there would seem to be little need for that.

Products:
- Twinlab: B1, 500 mg, thiamine mononitrate, 100 capsules.
- Solgar: B1, 50 mg, thiamine hydrochloride, 100 tablets.
- Ecological Formulas: Allithiamine, 50 mg thiamine tetrahydro furfuryl disulfide per capsule, 60 capsules.

**Thioctic Acid**

See Lipoic Acid.

**TMG**

Related Item: Betaine.

Description: TMG (trimethylglycine) is also known as betaine. It is closely related to choline. It functions biochemically as a methyl donor. It is also involved in the synthesis of the essential amino acid methionine from homocysteine.

Choline has four methyl groups. When choline reacts chemically and donates one of those methyl groups to another molecule, it forms betaine (trimethylglycine). When betaine donates one of its methyl groups, it forms DMG (dimethylglycine).

Uses: In enhancing the conversion of homocysteine to methionine, which requires folic acid, vitamin B6, and vitamin B12, betaine may lower the risk of heart disease. Betaine and choline may be involved in the prevention of fatty liver, neurotransmitter function, and the metabolism of fat. Agents that facilitate the liver’s ability to process fats are called lipotropic agents.

The body manufactures choline from methionine, with the aid of folic acid and vitamin B12 as coenzymes. Another form of betaine often seen in supplement form is betaine hydrochloride. This form is usually used as a source of hydrochloric acid, for digestive problems, rather than as a source of betaine.

Indications: Cholesterol problems, liver disorders, cardiovascular disease.

Products:
- Jarrow: TMG-500, anhydrous betaine, 120 tablets.
- Jarrow: TMG Crystals, anhydrous betaine, one teaspoon equals 2.6 g, 50 g.
- Source Naturals: TMG, 750 mg, 120 tablets.

**Tocotrienols**

Related Item: Vitamin E.

Description: Vitamin E is composed of two types of compounds, tocopherols and tocotrienols. Chemically, they differ in the structure of the side chain, with the tocotrienols having three double bonds and the tocopherols a saturated side chain.
Tocotrienols have similar activity, in general, to vitamin E. There is some evidence, however, that the tocotrienols are actually more effective in lowering cholesterol than vitamin E. Tocotrienols have hypocholesterolemic, anti-atherogenic, and antithrombotic activity. Some studies have also shown that tocotrienols may be of value in treating breast cancer. Tocotrienols are available alone, and in combination with mixed tocopherols. For general supplementation, we recommend using a mixed tocopherol vitamin E supplement that includes tocotrienols. For indications, see Vitamin E.

For those with cardiovascular disease or who are at risk of breast cancer, additional tocotrienols may be desirable.

Indications: Cholesterol problems, cancer (breast).
Dosage: The usual dose ranges from 100 to 400 milligrams daily.

Cautions: Those taking blood-thinning medication should be aware that vitamin E may also exert some blood-thinning action. Their pro-thrombin times should be monitored, and the amount of medication (Coumadin) should be adjusted accordingly.

Products:
- Yasoo Health: Vitamin E Factor Tocotrienols, 60 mg gamma tocotrienol, 68 mg total tocotrienols (rice source), and 39 mg vitamin E, 60 softgels.
- Solgar: Tocotrienol Complex, 25 mg gamma tocotrienol, 100 IU vitamin E, 60 softgels.

Trametes Versicolor

See Coriolus Versicolor.

Trimethylglycine

See TMG.

Tryptophan

Related Item: 5-HTP.
Description: Tryptophan is an essential amino acid. It is a precursor to serotonin synthesis in the body.
Uses: As a precursor to serotonin, tryptophan may induce sleep, as well as influence mood. It has been recommended for mild depression and as an appetite suppressant. Increasing serotonin intake results in increased melatonin, the natural hormone that regulates the body’s sleep cycle.
Cautions: Several years ago, a contaminated batch of tryptophan, manufactured in Japan, was thought to have caused eosinophilia-myalgia. The FDA removed tryptophan from the market, and has refused to rescind that ban, even though the problem may no longer exist.

Turmeric

See Curcumin.

Tyrosine

Description: L-tyrosine is an amino acid. In most instances, the body can synthesize enough tyrosine to fill its needs. Tyrosine is made from phenylalanine, and for those with phenylketonuria, it is an essential amino acid. Ty-
rosine is a precursor for the synthesis of the catecholamines epinephrine, norepinephrine, and dopamine, as well as the thyroid hormones thyroxine and triiodothyronine.

Uses: Supplemental L-tyrosine has been used as an antidepressant owing to its role as a precursor to the neurotransmitters norepinephrine and dopamine. Research in support of this function has not been overly convincing, with mixed results.

Indications: Depression.

Dosage: The typical dose is from 500 to 2,000 milligrams daily, but tyrosine supplementation should best be under the direction of a health professional.

Products:
- Solgar: Tyrosine, 500 mg, vegetarian and kosher, 250 vegicaps.

**Uva Ursi**

Description: Uva ursi (Arctostaphylos uva ursi) is an evergreen perennial shrub found in colder, northern climates. It is also known as bearberry, perhaps because bears like to eat its red berries. The active ingredient is thought to be arbutin, a hydroquinone derivative.

Uses: Uva ursi exerts an astringent and antiseptic action in the urinary tract. It is used as a urinary antiinflammatory agent, for the treatment of cystitis, and a treatment for mild infections of the urinary tract.

Indications: Urinary tract infections.

Dosage: For standardized extracts (20% arbutin), use 700 to 1,000 milligrams, three times a day. A tea can be made by steeping about 3 grams of uva ursi in a cup of boiling water. Take this three or four times daily.

For maximum effect, uva ursi should be used when the urine is alkaline. An alkaline pH can be encouraged by eating a diet rich in dairy products, vegetables, fruits, and potatoes. Or those who do not have high blood pressure (sodium restriction) can take baking soda (sodium bicarbonate).

Cautions: Treatment of a urinary tract infection is a medical problem, and should be done under the supervision of a health professional. Use of uva ursi or baking soda should not be required for more than two weeks.

Products:
- Nature’s Herbs: Uva Ursi, 500 mg uva ursi leaf, 100 capsules.
- Nature’s Answer: Uva Ursi, 2,000 mg uva ursi leaf fluid extract in 2 ml, 2 oz liquid.
- Nature’s Way: Uva Ursi Standardized Extract, 665 mg uva ursi leaf extract (20% arbutin), 300 mg uva ursi leaf per 2 capsules, 60 capsules.

**Valerian Root**

Description: Valerian root, as the name implies, consists of the underground part of the plant Valeriana officinalis. The components have been identified, but those actually responsible for its sedative activity remain undetermined.

Uses: Valerian root has sedative and sleep-promoting action. It is used alone, as a tea, tincture, tablet, or capsule, and in combination with other sedative herbs (hops, lemon balm, passion flower, etc.). The Commission E has officially recognized valerian for restlessness and sleeping disorders based on nervous conditions. Valerian is also reported to be of value in relieving pain and reducing muscle spasms.

Indications: Insomnia.

Dosage: Valerian is available in a wide variety of dosage forms. Follow the directions on the container.

Products:
- Solaray: Valerian Root, 470 mg, 100 capsules.
- Nature’s Way: Valerian Nighttime, 320 mg valerian root extract (0.2% valerenic acid), 160 mg lemon balm leaf extract, odor-free, 100 tablets.
- Nature’s Answer: Valerian Root, 1,000 mg valerian root fluid extract per ml, 2 oz liquid.
Vanadium

Related Item: Vanadyl sulfate.
Description: Vanadium is a trace mineral that has been shown to be essential in animals, but not yet for humans. Uses: Vanadium is of interest because it seems to mimic the action of insulin and, in large dosages, may improve glucose control in diabetics. The amounts used in preliminary studies are sufficiently high to raise serious concerns about toxicity. Since no actual deficiency state has been induced in humans, we do not know what the recommended daily intake will be. Estimates are in the range of only 10 to 50 micrograms per day.
Cautions: At this time, the higher doses used by some, including bodybuilders, are not recommended.

Vanadyl Sulfate

Related Item: Vanadium.
Description: Vanadyl sulfate is a form of vanadium used in dietary supplements.
Uses: Vanadium, even as vanadyl sulfate, is very poorly absorbed. It may eventually be shown to be of value to diabetics in controlling blood glucose, but additional research is necessary. For one thing, a dose that is effective while not toxic remains to be determined. Dosages vary over a wide range (50 to 10,000 micrograms), but the safety of long-term use remains to be determined. Therefore, we suggest using higher doses only when recommended by a health professional.
Products:
Country Life: Vanadyl Sulfate, 5,000 mcg vanadyl sulfate, 90 capsules.

Vinpocetine

Description: Vinpocetine is a derivative of an alkaloid derived from a plant in the periwinkle family (Vinca minor).
Uses: Vinpocetine has been used to enhance mental function. It may be helpful in treating or preventing dementia, but additional research is needed. It seems to enhance memory and learning. It has also been shown to be of benefit in the treatment of stroke, perhaps owing to its powerful cerebral vasodilating and blood-thinning activity. In many respects, its actions and roles seem similar to those associated with ginkgo biloba.
Indications: Age-related cognitive decline, stroke, mental function, tinnitus.
Cautions: Vinpocetine may add to the effect of anticoagulant medications such as Coumadin (warfarin).
Products:
Jarrow: Vinpocetine, 5 mg, extracted from the periwinkle plant, 100 capsules.

Vitamin A

Related Item: Carotenoids.
Description: Vitamin A is a fat-soluble vitamin. It is actually a group of substances of similar structure. The prominent component is retinol. The term retinoids refers to retinol, its metabolites (retinoic acid), and related compounds.
Uses: Vitamin A is essential to embryonic cell differentiation and growth. It is required for vision and the maintenance of the retina and other parts of the eye. It is involved in immune system function, and may have certain anticancer roles in the body. It has also been shown to be useful in preventing various skin disorders, and is required for optimal integrity of the mucous membranes. Adequate vitamin A status is necessary for normal reproductive function.
Too much vitamin A can lead to toxicity, but too little vitamin A can be equally detrimental. Women who might become pregnant, for example, have been warned, quite rightly, to avoid too much vitamin A, as it may lead to an increased incidence of birth defects. They have been warned to keep their daily intake of vitamin A below 5,000 IU daily. Some actually warn them to avoid vitamin A altogether, and take only carotenoids. This leads to confusion, with some women thinking that they cannot even take more than 5,000 IU of carotenoids. What they forget, unfortunately, is that too little vitamin A causes birth defects as well! Just as it is often a mistake to think that if a little of something is good for you, a larger amount is even better, it is also a mistake to think that if too much of something is bad for you, none at all is even better!

Everyone needs vitamin A, and that includes pregnant and soon-to-be pregnant women. Dosages up to 5,000 IU of preformed vitamin A daily are appropriate for pregnant women. Carotenoids, the substances that can serve as dietary precursors of vitamin A, can be taken in higher amounts. (See Carotenoids.) Most supplements contain 15,000 to 25,000 IU of carotenoids.

There are some multivitamin formulations that contain no pre-formed vitamin A at all. Instead, they rely only on carotenoids to provide the equivalent of 5,000 to 10,000 IU of vitamin A. This may be a mistake. We prefer to have at least part of the vitamin A requirement met by preformed vitamin A.

Note: Vitamin A can be obtained either from preformed vitamin A (vitamin A palmitate, vitamin A acetate, fish oil) or from the dietary precursor to vitamin A, carotenoids (beta-carotene, mixed carotenoids). Both forms are labeled in terms of their vitamin A activity. On labels, the units of activity are IUs, or International Units.

This can lead to confusion, as vitamin A, in high doses, can be toxic while carotenoids are not. If a label states: 8,000 IU of vitamin A (4,000 IU vitamin A palmitate, 4,000 IU natural beta-carotene), this means only 4,000 of the 8,000 IU of vitamin A activity actually comes from preformed vitamin A. It means, as well, that this product can be used by a woman who might become pregnant.

Even though taking higher doses of carotenoids has not been shown to be dangerous, many physicians recommend limiting the total intake of carotenes during pregnancy to under 8,000 to 10,000 IU daily as well. Others feel that higher levels of carotenoids are not a problem. Carotenes themselves are safe in high quantities. Bear in mind that one medium-size carrot has 8,000 IU of beta-carotene! The body converts only the amount of carotene to vitamin A that it needs. Taking higher doses of carotene does not mean you are getting more vitamin A. Beyond their role as precursors to vitamin A, carotenoids are powerful antioxidants and it is a mistake to reduce your intake of natural carotenoids for fear of vitamin A toxicity.

Indications: Immune system, night blindness, vision problems, skin disorders, cancer, cystic fibrosis, bronchitis, macular degeneration.

Dosage: The recommended daily intake of preformed vitamin A is 3,000 to 5,000 IU. Supplements often contain up to 10,000 IU daily, but there is little justification for more than 5,000 IU of that to be supplied by preformed vitamin A. Vitamin A as carotenoids or beta-carotene can be taken in substantially higher amounts.

Vitamin A is present in supplements in two forms: vitamin A palmitate (retinyl palmitate) and vitamin A acetate (retinyl acetate). Both forms are well absorbed. Emulsified and “micellized” forms of vitamin A are available as well, but as the regular form is well absorbed, the advantages claimed for these liquid forms is questionable.

Cautions: Preformed vitamin A (vitamin A acetate, vitamin A palmitate, retinol) can be toxic (hypervitaminosis A) at high levels. Natural carotenoids have not been shown to be toxic at high doses. Women who might become pregnant should limit their intake of pre-formed vitamin A to no more than 5,000 to 8,000 IU daily.

Products:
- Twinlab: Allergy A Caps, 10,000 IU vitamin A from retinyl acetate, dry, fish-free, water-dispersed for easier digestion, 100 capsules.
- Carlson: Vitamin A, 25,000 IU emulsified, 25,000 IU vitamin A from fish liver oil, 100 softgels.
**Vitamin B1**

See Thiamine.

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**Vitamin B2**

See Riboflavin.

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**Vitamin B3**

See Niacin.

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**Vitamin B5**

See Pantothenic Acid.

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**Vitamin B6**

See Pyridoxine.

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**Vitamin B12**

Related Items: Cobalamin, methylcobalamin.

Description: Vitamin B12 is one of the B vitamins. It contains cobalt as might be surmised from its other name, cobalamin. It is one of the most complex of all of the vitamins, and resembles hemoglobin and chlorophyl in structure. It is needed for the proper functioning of all cells, especially those of the nervous system, bone marrow, and gastrointestinal tract. Vitamin B12 is required for red blood cell formation, and it works closely with folic acid to form methionine, influencing homocysteine levels.

Uses: Vitamin B12 deficiency is associated with pernicious anemia, gastric surgery, chronic illness, and old age. People who are strict vegetarians are very likely to be deficient in vitamin B12. People with H. pylori infections, HIV, and parasitic infections are often deficient.

For optimal absorption of vitamin B12, a substance called intrinsic factor, found in the lining of the stomach, is required. When insufficient levels of intrinsic factor are present, pernicious anemia results.

Unlike the other water-soluble B vitamins, vitamin B12 is stored in the body, and it may take some time for the overt symptoms of a deficiency to manifest themselves—sometimes up to five years of low intake or impaired absorption.

Vitamin B12 is not found in plants. This is why strict vegetarians, or vegans, are at risk of B12 deficiency. Some have claimed that products like spirulina and blue green algae contain vitamin B12, but this does not seem to be the case. They contain similar compounds, but these substances do not exhibit vitamin B12 activity.

A deficiency manifests itself through impaired nerve and mental function, anemia, and disorders of the lining of the mouth, tongue, and bowels. Often, the symptoms resemble Alzheimer’s disease.

Some nutritionists feel that the elderly should all be given vitamin on a preventive basis.

Contrary to previous dogma, oral vitamin B12 can be an effective supplementation route. Injectable B12 is not the only option. It turns out that a small amount of vitamin B12 will be absorbed regardless of intrinsic factor status. The higher the dose of oral vitamin B12, the lower the percentage that gets absorbed. But some does. And what has been found is that when a high enough dose is given, sometimes in the 500- to 1,000-microgram range, enough vitamin B12 is absorbed to satisfy the body’s requirements, and correct a deficiency.
There are several forms of vitamin B12 available as supplements. The regular form, also called cyanocobalamin or cobalamin, is available in tablets, capsules, and lozenges. Cyanocobalamin is stable and effective. Another similar form is hydroxocobalamin. Some studies indicate that the hydroxocobalamin form is better retained by the body.

These forms of vitamin B12 are converted in the body to one of two active (coenzyme) forms, methylcobalamin and adenosylcobalamin (see Dibencozide). Both are also available in supplements. Each of the coenzyme forms of B12, however, participate in different enzyme systems, and we question whether taking one or the other alone is more advantageous than taking a high-potency cobalamin supplement.

The use of sublingual lozenges, or nuggets, as a way of enhancing the absorption of oral vitamin B12 has been popularized over the years. Unfortunately, there is little evidence that it works. Vitamin B12 is a very large molecule, and one would not logically expect it to be readily absorbed sublingually. Instead, as the lozenge dissolves, the B12 is swallowed, and absorbed the same way as are the other forms. There is no harm in taking vitamin B12 in lozenge form, but there may be no advantage in doing so.

Indications: Anemia (pernicious), malabsorption conditions, chronic fatigue syndrome, gastrointestinal disorders, cardiovascular disease, nutritional support (elderly), tinnitus.

Dosage: The recommended daily intake is from 2.4 to 6 micrograms, but oral supplementation is usually given in doses from 100 up to 5,000 micrograms. Vitamin B12 is nontoxic and safe at high doses.

Products:
- Twinlab: B12 Dots, 500 mcg, 250 lozenges.
- Solgar: B12 Nuggets, 1,000 mcg, 250 tablets.
- Solgar: B12 Megasorb Nuggets, 5,000 mcg, 5,000 mcg cobalamin and 100 mcg dibencozide, 60 tablets.

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**Vitamin C**

Related Items: Buffered vitamin C; magnesium ascorbate; calcium ascorbate; ascorbyl palmitate; ester-C.

Description: Vitamin C (ascorbic acid) is a water-soluble vitamin with numerous functions. To be most precise, it is the L-form, L-ascorbic acid, that possess vitamin activity. A powerful antioxidant, vitamin C protects against oxidative damage throughout the body. It also enhances the activity of other antioxidant vitamins. Vitamin C is needed in the formation of collagen, the main protein essential to the integrity of connective tissue, cartilage, bone matrix, tooth dentin, skin, and tendons.

Uses:
- Infections, cold, and flu: Vitamin C has been shown to be effective in treating various viral infections, including, according to many complementary physicians, chronic fatigue syndrome, hepatitis, herpes, and AIDS. While vitamin C’s ability to protect against, or cure, the common cold remains somewhat controversial, there seems to be no question that it reduces the severity of the symptoms and the duration.
- Heart disease: Vitamin C protects against heart disease by preventing the oxidation of LDL cholesterol, which can then turn into atherosclerotic plaque.
- Stress: Vitamin C is involved in adrenal cortical hormone production and function. During periods of emotional, psychological, or physiologic stress, levels of these hormones are increased, and urinary excretion of vitamin C is increased. During periods of stress, therefore, supplementation with vitamin C may be helpful.
- Cancer: There is evidence that vitamin C can prevent certain cancers, such as gastric, breast, and cervical cancers, perhaps owing to its protective antioxidant action, for example, blocking the creation of nitrosamine from nitrates. Many complementary physicians utilize vitamin C as part of their cancer treatment protocols; it is thought to lengthen survival time and improve quality of life.
Bruising, capillary fragility, hemorrhoids, varicose veins: Vitamin C, especially when administered with bioflavonoids, is recommended for these problems owing to its role in strengthening and tonifying the vessel wall.

Glaucoma, cataracts, vision disorders: Vitamin C is one of the antioxidants that protects the eye from free radical oxidative damage; high doses of vitamin C have been shown in several studies to reduce elevated intraocular pressure.

There are many additional conditions that may benefit from vitamin C supplementation: gout, gallstones, asthma, allergies, bronchitis, gingivitis, periodontal disease, wound healing, autism, cold sores, diabetes, gastritis, immune function, iron-deficiency anemia, lead toxicity, among others.

Indications: Cancer, cataracts, cold and flu, cholesterol problems, cardiovascular disease, hypertension, Helicobacter pylori, asthma, stress.

Dosage: The recommended daily allowance for vitamin C is from 75 to 90 milligrams for nonsmokers, and 110 to 125 milligrams for smokers. The amounts typically found in supplements will provide between 500 and 1,000 milligrams daily, although some claim that 200 milligrams are enough to ensure maximum tissue levels. Many take much higher amounts. Some, for example, take 4 to 5 grams daily to ameliorate the symptoms of a cold. Some of the research studies have used doses in the 5-gram daily range. Daily intakes up to 2 or 3 grams a day are generally considered benign. Too high a dose will result in diarrhea.

Cautions: The only consistent adverse effect of high dose vitamin C is gastric upset or diarrhea. Because the normal catabolism of vitamin C leads to oxalate, there is concern that high doses of vitamin C could increase the risk of kidney stones. Clinically, this does not seem to be the case, but those with a history of oxalate stone formation should consult with their physician before taking doses over 1 gram.

Products:
Solgar: Vitamin C, 1,000 mg, L-ascorbic acid, 100 vegicaps.
Allergy Research: Pure Vitamin C, 2,000 mg ascorbic acid (beet source) per half teaspoon, 120 g powder.

**Vitamin C with Bioflavonoids**

Related Item: Vitamin C.

Description: Vitamin C is often presented in supplements with bioflavonoids. The most common flavonoids used in these products are citrus bioflavonoids, although a wide variety of mixtures can be employed.

Uses: There is a persistent belief that vitamin C and bioflavonoids work synergistically together. While both vitamin C and the various flavonoids have many actions totally independent of each other, they also share many functions. They are both powerful antioxidants. They often occur together in nature. The flavonoids have historically been thought to strengthen blood capillaries, along with vitamin C.

Vitamin C is good, flavonoids are good, they are found together in food, and it makes sense to take them together in supplements as well.

Products:
Solgar: Hy-Bio, 500 mg vitamin C, 500 mg citrus bioflavonoids, 50 mg rutin and 50 mg rose hips fruit, 250 tablets. Note: One of the highest level of bioflavonoids in a combination product.
Twinlab: C-Plus Citrus Bioflavonoids, 1,000 mg vitamin C, 650 mg citrus bioflavonoids, 50 mg rutin per 2 capsules, 250 capsules.

**Vitamin D**

Description: Vitamin D can be considered both a vitamin and a hormone. There are two forms of vitamin D found in food, vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Our body can produce vitamin D through the action of sunlight on the skin.

Ergocalciferol (D2) is derived from plants, and cholecalciferol (D3) is derived from animal sources. For those
who prefer a nonanimal source, D2 supplements are available.

Uses: A deficiency of vitamin D results in rickets (children) or osteomalacia (adults). It is caused by an inability to incorporate calcium in bone. This was once a common problem, but now usually seen only in elderly people who fail to get adequate exposure to sunlight.

While vitamin D is usually associated with the absorption of calcium and bone status, it also seems to have a role in the prevention of breast and colon cancer. It may also have some influence on the prevention of diabetes, multiple sclerosis, and general immune system function.

Indications: Osteoporosis, Crohn’s disease, cystic fibrosis, osteomalacia.

Dosage: For those who are frequently exposed to sunlight, supplemental vitamin D may be unnecessary. For most, however, 400 IU per day are recommended. Those who are at risk, such as the elderly and those not exposed to sunlight, should be taking 800 IU daily.

Products:
- Solgar: Vitamin D, 400 IU, 400 IU vitamin D3 (cholecalciferol) and 1,000 IU vitamin A from fish liver oil, 100 softgels.
- Twinlab: Allergy D Caps, 400 IU, fish-free, water-dispersed vitamin D3 100 capsules.

Vitamin E

Related Items: Tocopherol, tocotrienol, dry vitamin E, mixed tocopherols.

Description: Vitamin E is a collective term for a family of substances that includes four tocopherols (alpha, beta, gamma and delta) and four tocotrienols (alpha, beta, gamma, and delta). Vitamin E is a fat-soluble vitamin and a powerful antioxidant. In the case of vitamin E, there is a difference in activity between natural and synthetic forms. New evidence indicated that the natural form may actually be twice as active as the synthetic form.

Uses: Vitamin E is an important antioxidant. Because it is fat-soluble, it exerts its protective effect very efficiently at the cell membrane (which contains a high proportion of fat) level. Vitamin E is now recognized, even by mainstream medicine, as protective against cardiovascular disease and some forms of cancer. It may also be of some benefit to those with rheumatoid arthritis, asthma, neurological diseases, cataracts, diabetes, and premenstrual syndrome. It can protect against environmental toxins and enhances immune system function.

For historical and regulatory purposes, the potency of vitamin E is related to one form, alpha tocopherol. But each form of vitamin E has value, and some are more beneficial than others depending on the function. Alpha tocotrienol, for example, may have higher antitumor activity than alpha tocopherol, even though the latter has higher “vitamin E” activity.

Here are the choices available to you for vitamin E supplements:
  • Natural or synthetic. The natural forms of vitamin E can be identified by the prefix “d-” (d-alpha tocopheryl acetate) and the synthetic form has the prefix “dl-” (dl-alpha tocopheryl acetate). The natural form is generally twice as potent as the synthetic form.
  • Esterified or unesterified. When the form of vitamin E ends in “-ol,” it is the unesterified, free form (tocopherol), and when it ends in “-yl” it is the esterified form, either an acetate ester or a succinate ester (tocopheryl acetate). The esterified forms are more stable.
  • Alpha tocopherol only or the mixture of all of the tocopherols. Mixed tocopherols consist of a mixture of all four tocopherols (alpha, beta, gamma, and delta). They can also contain the four tocotrienols. The labeled potency, in IU, only refers to alpha tocopherol, but each of the eight isomers has activity, and some have different actions.
  • Tocopherols or tocotrienols. As already mentioned, there are four tocopherols and four tocotrienols in the vitamin E family of compounds. The tocotrienols have different activity, and may be uniquely beneficial in treating cardiovascular disease and certain types of cancer.

Here is our recommendation: Natural vitamin E (the d- form) is superior to the synthetic form (the dl- form).
The esterified form, the acetate or succinate, is preferred as a supplement because it is more stable. The mixed tocopherol form, however, while not esterified, is superior because it contains the three other isomers of vitamin E, and a mixed tocopherol with tocotrienols is even better.

So we suggest a mixed tocopherol and tocotrienol complex as the best form of vitamin E supplement.

Indications: Anti-aging, cardiovascular disease, immune system, cancer, asthma, arthritis, cataracts, Alzheimer’s disease, skin conditions (topical), tardive dyskinesia, diabetes.

Dosage: The current situation regarding the labeling of alpha tocopherol activity is very confusing. Forget it. Instead, an appropriate dose of natural vitamin E supplements should be from 100 to 400 IU daily. If using the synthetic form, it should be 200 to 800 IU daily. Doses up to 800 IU of natural vitamin E are acceptable when indicated. Even though vitamin E is a fat-soluble vitamin, it has an excellent safety record.

Cautions: Those taking blood-thinning medication should be aware that vitamin E may also exert some blood-thinning action. Their pro-thrombin times should be monitored, and the amount of medication (Coumadin) should be adjusted accordingly.

Products:
- Yasoo Health: Vitamin E Factor 400/400, 400 IU vitamin E as d-alpha tocopherol, 400 mg beta, gamma, and delta tocopherols, 31 mg gamma tocotrienol, 5 mg alpha, beta, and delta tocotrienols, 60 softgels.
- Solgar: E 400 Mixed Tocopherols, 400 IU vitamin E as d-alpha tocopherol, plus beta, gamma, and delta tocopherols, 250 softgels.
- Solgar: E 400 Dry, 400 IU vitamin E as d-alpha tocopheryl succinate, 250 vegicaps.
- Carlson: E Gems 400 IU, 400 IU vitamin E as d-alpha tocopheryl acetate, 200 softgels.
- Allergy Research: Vitamin E, 400 IU, synthetic vitamin E, dl-alpha tocopheryl acetate (hypoallergenic), 120 softgels.

Vitamin K

Description: Vitamin K is essential for proper blood clotting. The “K” is derived from the German word Koagulation, which means clotting. Vitamin K is available in three forms. The natural form, Vitamin K1 (phyloquinone or phytonadione), found in green leafy vegetables, is the preferred type, as it seems to have the broadest activity.

Uses: A deficiency of vitamin K is rare, but can occur in those who do not eat vegetables, are on long-term anticoagulant and/or antibiotic therapy, or suffer from various types of malabsorption conditions or liver disease.

There is some interest in the role of vitamin K in osteoporosis. It is involved in bone formation, and evidence is accumulating that those who might be low in vitamin K have increased osteoporosis.

Indications: Nutritional support, osteoporosis, malabsorption conditions.

Dosage: For general supplementation, usually as part of a broad-spectrum multivitamin product, amounts of vitamin K between 50 and 100 micrograms are recommended. The recommended daily value is 80 micrograms.

The preferable form of vitamin K in supplements is vitamin K1 (or phyloquinone). It is also present in oil-soluble chlorophyll supplements.

Cautions: Those taking anticoagulant medications (warfarin, Coumadin) should avoid supplementation, especially at doses over the daily value (80 micrograms), without notifying their physician.

Products:
- Solgar: Vitamin K, 100 mcg, phytonadione, 250 tablets.
- Orjene: Vitamin K Cream, 2% phytonadione cream, 60 grams.

Vitex

See Chaste Tree Berry.
Western Larch

See Larch, Western.

Wheat Grass

Related Items: Spirulina, green foods, chlorella, chlorophyll, blue green algae.

Description: As with all green-food supplements, wheat grass concentrate is relatively rich in protein, chlorophyll, and carotenoids. Marketing claims to the contrary, there is little documented therapeutic difference among these products.

Uses: Green food concentrates of this type are claimed to have anti-cancer activity, modulate immune system function, lower cholesterol, treat gastrointestinal problems, and function, generally, as detoxification agents.

While convincing proof of all these actions may be lacking, there is certainly no reason not to include one of the green food concentrates in a comprehensive supplement program. They are all rich in phytonutrients, antioxidants, and varying amounts of trace nutrients. The problem with these supplements is that exaggerated marketing claims often accompany the products, and consumers may overestimate their value. As a general rule, they should be considered adjuncts to other supplements, not replacements or alternatives to them.

Cautions: Green food supplements may be rich in vitamin K, so caution should be exercised if you are taking anticoagulant medication.

Products:
- Pines: Wheat Grass Powder, 2 teaspoons equal one large serving of green leafy vegetable, 10 oz powder.

Whey Protein

Description: There are two main types of protein in milk. The most plentiful type is casein, which is easily precipitated (curds) in making cheese. The soluble protein fraction, whey, has a higher biological value and remains after the curd (casein) is removed.

As the water, fat, and lactose are removed, a whey protein concentrate is obtained. Such concentrates can contain up to 80 percent whey protein, with the balance consisting mostly of lactose. Further removal of the remaining lactose results in highly purified, high-protein whey isolates.

Uses: Whey protein can be used for two purposes. As a protein, a source of amino acids that are the building blocks for almost all parts of the body, whey is one of the highest-quality sources available. The higher the quality of protein, the less amount one needs to fulfill the body’s requirements. Whey is relatively bland in flavor, and easily tolerated, making it an ideal protein supplement for those who need general nutritional support, and those who need additional protein for bodybuilding and athletic purposes.

The other use for whey protein revolves around its possible immunomodulating and antimicrobial activity. This is related to certain specific components of whey, such as lactoferrin, various immunoglobulins, bovine serum albumin, etc.

These compounds are thought to exert their beneficial actions in different ways. The lactoferrin, for example, binds iron. Iron is a nutrient essential to microbial growth. So by depriving pathogenic bacteria of the iron they need for growth, lactoferrin-containing whey protein may exert antimicrobial activity. Whey contains precursor components to glutathione, and by increasing glutathione levels, whey may affect immune function. The immunoglobulins in whey function as antibodies. When immunoglobulins are made in our body, in response to various antigens, it is called active immunity. When the immunoglobulins are obtained from an external source, as from whey protein, it is called passive immunity.

There are three types of whey protein isolates now being marketed:
1. Ion-exchange.
2. Microfiltration or ultrafiltration.

The proponents of each type claim theirs is superior to the others. Arguing that one is better than the other, as an immunomodulating agent, because it contains more glutathione precursors, seems pointless. One type yields more lactoferrin, but less serum albumin. The other yields more serum albumin and less lactoferrin. If it is the lactoferrin that is so important, why not take a lactoferrin supplement? If it is the glutathione precursors that are so important, why not just take a glutathione supplement? As a source of high-quality protein, the isolation process is of no consequence. The same is probably true for whey’s other purposes as well. The heightened interest in whey’s possible anticancer and immune-enhancing action is exciting, but preliminary.

Indications: Nutritional support, immune system.

Products:
- Bioplex Nutrition: Pure Whey Protein Isolate, 22.2 g whey protein isolate, providing 20 g protein, no fat or carbohydrate, 5570 mg BCAAs (branched chain amino acids) per scoop, 2 lb powder (908 g). Note: This product positioned as a post-workout supplement.
- Jarrow: Whey Protein, 23 g whey protein, providing 18 g protein, 4600 mg BCAAs per scoop, and 51% beta lactoglobulin, 20% alpha lactalbumin, 10% immunoglobulin, 2 lb powder (908 g). Note: This product positioned as post-workout and immune-enhancing supplement.

Willow Bark

Description: The bark of young willow tree branches is the source of this herbal supplement. The bark contains natural salicylates, which account for its anti-inflammatory, fever-reducing, and analgesic activity. Salicin is the primary salicylate present. These natural salicylates, first isolated from the plant meadowsweet, are the precursors to the drug acetylsalicylic acid, commonly known as aspirin.

Uses: Willow bark (Salix alba) is used as an analgesic, anti-inflammatory, and antipyretic (fever-reducing) agent. Natural salicylic acid is thought to produce fewer side effects than synthetic acetylsalicylic acid (aspirin). Like aspirin, the salicin in willow bark is thought to exert its analgesic action by blocking prostaglandin synthesis.

Indications: Pain, arthritis, sports injuries, bursitis.

Dosage: Typically, an amount of herbal extract is used that is equivalent to between 60 and 120 milligrams of total salicin daily. Follow the directions on the label. Willow bark is available as dry extract (capsules), as well as tinctures and teas.

Cautions: Some caution that willow bark preparations should not be used by small children with the flu (Reye’s syndrome), but this may not be a valid concern. The salicylates in willow are not metabolized in the same way as aspirin (acetylsalicylic acid). Follow your doctor’s advice.

Products:
- Nature’s Answer: White Willow Bark, 200 mg white willow bark extract (15% salicin), 200 mg white willow bark powder, 60 vegicaps.
- Nature’s Answer: White Willow Bark Alcohol Free, 2,000 mg white willow bark fluid extract per 2 ml, 1 oz liquid.

Yohimbe Bark

Description: Yohimbe (Pausinystalia yohimbe) is a tall evergreen forest tree, native to Africa. Its main constituent
is an indole alkaloid, yohimbine, and most of the research has been on yohimbine rather than yohimbe bark.

**Uses:** The bark has been used traditionally in western Africa as an aphrodisiac, especially for male erectile problems. There is evidence that yohimbine is effective in some cases of impotence, but isolated yohimbine is very drug-like, with side effects and contraindications to match. There is a lack of positive research on the crude bark. There is also some question as to the integrity of some of the yohimbe bark products on the store shelves, many of which have been found to contain little if any yohimbine.

**Indications:** Sexual performance.

**Dosage:** Follow directions on the bottle.

**Cautions:** Yohimbine can cause nervousness, tremor, sleeplessness, anxiety, increased blood pressure, rapid heart-rate, dizziness, nausea, and vomiting. Do not use yohimbe in the presence of liver and kidney disease, peptic ulcer, or inflammation of the prostate. If taking antidepressant medication, do not take yohimbe unless under the supervision of a physician.

**Products:**
- Twinlab: Yohimbe Fuel, 400 mg yohimbe bark extract (8% yohimbine alkaloids), 100 capsules.
- Country Life: Yohimbe Power 1000, 1,000 mg yohimbe bark (4% yohimbine alkaloids), 90 capsules.

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**Zeaxanthin**

**Related Items:** Carotenoids, lutein.

**Description:** Zeaxanthin is one of the xanthophyll carotenoids. Lutein is another. The carotenoids, or carotenes, are the red, orange, and yellow plant pigments that protect against oxidative damage during photosynthesis. There are more than 600 carotenoids in nature.

**Uses:** The macula of the eye contains very high concentrations of lutein and zeaxanthin. These carotenoids protect the macula from the harmful effects of ultraviolet light. Studies have shown that older people with the highest intake of carotenoids have the lowest rate of age-related macula degeneration. The lutein and zeaxanthin in supplements are often made from marigolds.

**Indications:** Cataracts, macular degeneration.

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**Zinc**

**Related Item:** Zinc lozenges.

**Description:** Zinc is an essential mineral. It is involved in the function of hundreds of different enzymes throughout the body. It is required for the proper function of many of the important hormones, and is involved in growth and energy production. While severe zinc deficiency is rare in developed countries, mild to moderate deficiency is common, especially among the elderly. The average American diet, for example, does not provide the recommended daily level of zinc.

**Uses:** Zinc is important for proper immune system function. Several studies have shown that zinc, in the form of a lozenge, reduces the duration of the common cold in adults.

Zinc is essential for growth, and seems to play a role in promoting or accelerating wound healing.

Preliminary research indicates zinc may be protective against prostate cancer. It has long been used by those with benign prostatic hypertrophy, and is also thought to be involved in male fertility, prostate, and sexual function.

Zinc is involved in maintaining optimal vision, taste, and smell. Poor night vision, for example, is one sign of zinc deficiency, as is loss of taste.

Zinc has also been used as a treatment for acne. Not all studies have shown zinc to be effective, but this may be due to the type of zinc used.

Zinc’s benefit to those with vision problems, including macular degeneration, continues to garner support. Studies
that include zinc along with other antioxidants have supported its role for this condition.

There is also some evidence that a zinc deficiency contributes to Alzheimer’s disease. As already mentioned, moderate zinc deficiency is common among the elderly. Some research has shown that zinc supplementation in those who already have Alzheimer’s disease results in improvement.

Indications: Alzheimer’s disease, benign prostatic hypertrophy, cancer (prostate), cold and flu, fertility (male), immune system, macular degeneration, night blindness, sexual performance, wound healing.

Dosage: The general range of zinc dosage is between 15 to 30 milligrams. When zinc is used therapeutically, amounts up to 60 milligrams daily are commonly recommended by health professionals. The amount of zinc in lozenges intended for treating the common cold ranges from 13 to 25 milligrams. These lozenges can be taken every 2 hours, but should be limited to two or three days only.

Too much zinc, over an extended period of time, can result in depressed copper levels. This is because zinc competes with copper for absorption. As little as 2 milligrams of copper daily, an amount in most multivitamin supplements, may be all that is needed to prevent this problem.

There are many different forms of zinc available in supplements. Some, like zinc oxide, are generally considered to be poorly absorbed, and supplements containing this form of zinc should be avoided. Zinc sulfate may be slightly better than oxide, but it is not as good as other forms of zinc, and should also be avoided. Zinc gluconate, zinc citrate, zinc chelate (amino acid), zinc picolinate, and similar organic compounds of zinc are the preferred forms. For zinc lozenges, so far the best results have been obtained with zinc gluconate.

If there are differences between the forms of zinc recommended above, the differences seem to be small, while the improvement over the inorganic oxide and sulfate form seems to be what is important.

Cautions: If taking high levels of zinc for an extended period of time, be sure to include at least 2 milligrams of copper in your supplement program.

Products:
- Ethical Nutrients: Zinc Status Liquid, 2.4 mg zinc sulfate per 10 ml, 4 oz. After placing 10 ml in the mouth, a lack of taste or a delayed taste perception suggests a possible zinc insufficiency.
- Solgar: Chelated Zinc, 22 mg zinc glycinate, 250 tablets.
- Natrol: Optilinc 30, mg, zinc monomethionine, 120 capsules.

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**Zinc Chelate**

Related Item: Zinc.

Description: Zinc chelate, or zinc amino acid chelate, or zinc glycinate are forms of zinc intended for use in dietary supplements. Zinc is complexed with organic compounds, usually amino acids, to form a chelate that is more readily absorbed by the body than inorganic forms of zinc such as the sulfate and oxide.

Uses: Zinc is important for proper immune system function. It is essential for growth and seems to play a role in promoting or accelerating wound healing.

Preliminary research indicates zinc may be protective against prostate cancer. It has long been used by those with benign prostatic hypertrophy and is also thought to be involved in male fertility, and prostate and sexual function.

Zinc is involved in maintaining optimal vision, taste, and smell. Poor night vision, for example, is one sign of zinc deficiency, as is loss of taste. Zinc’s benefit to those with vision problems, including macular degeneration, continues to garner support. Studies that include zinc along with other antioxidants have supported its role for this condition.

Zinc has also been used as a treatment for acne. Some evidence also exists that a zinc deficiency contributes to Alzheimer’s disease. It is well known that moderate zinc deficiency is common among the elderly. Some research has shown that zinc supplementation in those who already have Alzheimer’s disease results in improvement.

Products:
- Solgar: Chelated Zinc, 22 mg zinc glycinate, 250 tablets.
- Natrol: Optilinc 30, mg, zinc monomethionine, 120 capsules.
Zinc Gluconate

Related Item: Zinc.

Description: Zinc gluconate is a form of zinc used in nutritional supplements. A gluconate is a mineral-glucose compound that is absorbed better than inorganic zinc salts such as zinc oxide or zinc sulfate.

Uses: Zinc is important for proper immune system function. It is essential for growth and seems to play a role in promoting or accelerating wound healing.

Preliminary research indicates zinc may be protective against prostate cancer. It has long been used by those with benign prostatic hypertrophy and is also thought to be involved in male fertility, and prostate and sexual function.

Zinc is involved in maintaining optimal vision, taste, and smell. Poor night vision, for example, is one sign of zinc deficiency, as is loss of taste. Zinc’s benefit to those with vision problems, including macular degeneration, continues to garner support. Studies that include zinc along with other antioxidants have supported its role for this condition.

Zinc has also been used as a treatment for acne. Some evidence also exists that a zinc deficiency contributes to Alzheimer’s disease. It is well known that moderate zinc deficiency is common among the elderly. Some research has shown that zinc supplementation in those who already have Alzheimer’s disease results in improvement.

Products:
- Solgar: Zinc “50,” 50 mg zinc gluconate, 100 tablets.
- Twinlab: Zinc Caps, 50 mg, zinc gluconate and zinc picolinate, 180 capsules.

Zinc Lozenges

Related Item: Zinc.

Description: Zinc lozenges are supplements containing zinc, usually as zinc gluconate, gluconate/glycinate, or acetate, intended to be dissolved in the mouth.

Uses: Zinc lozenges are specifically intended for use as a treatment for the common cold. Several studies have shown that zinc lozenges are indeed effective in this regard, especially if the form of zinc mentioned above is used. The product may exert a direct antiviral action in the throat.

The use of the term homeopathic in conjunction with this type of product seems to be more of a marketing gimmick than anything else. Homeopathic remedies for the cold or flu are fine, and often effective. But zinc lozenges, with zinc levels between 13 and 25 milligrams, are not homeopathic preparations.

Dosage: One lozenge, dissolved in the mouth, every two hours, for two or three days.

Cautions: Zinc lozenges are not intended for long-term use. With the intended purpose of limiting the duration and severity of the common cold, there should be no reason to continue taking zinc lozenges for more than two or three days, at most.

Products:
- Country Life: Zinc Lozenges Lemon Flavor, 23 mg zinc gluconate and citrate, and 100 mg vitamin C, 120 lozenges.
- Twinlab: Zinc Lozenges Cherry Flavor, 23 mg zinc gluconate, and 30 mg Vitamin C, 75 lozenges.

Zinc Picolinate

Related Item: Zinc.

Description: Zinc picolinate is a form of zinc used in nutritional supplements. It is a complex formed by reacting picolinic acid, a natural metabolite found in breast milk, related to the B-vitamin niacin, with zinc. Zinc picolinate
is absorbed better than inorganic zinc salts such as zinc oxide or sulfate.

Uses: Zinc is important for proper immune system function. Zinc is essential for growth and seems to play a role in promoting or accelerating wound healing.

Preliminary research indicates zinc may be protective against prostate cancer. It has long been used by those with benign prostatic hypertrophy and is also thought to be involved in male fertility, and prostate and sexual function.

Zinc is involved in maintaining optimal vision, taste, and smell. Poor night vision, for example, is one sign of zinc deficiency, as is loss of taste. Zinc’s benefit to those with vision problems, including macular degeneration, continues to garner support. Studies that include zinc along with other antioxidants have supported its role for this condition.

Zinc has also been used as a treatment for acne. Some evidence also exists that a zinc deficiency contributes to Alzheimer’s disease. It is well known that moderate zinc deficiency is common among the elderly. Some research has shown that zinc supplementation in those who already have Alzheimer’s disease results in improvement.

Products:

Solgar: Zinc Picolinate, 22 mg, vegetarian and kosher, 100 tablets.

NOW Foods: Zinc Picolinate, 50 mg, 120 capsules.
THERAPEUTIC CROSS-REFERENCE

The following cross-reference is intended to help you pick out the appropriate supplements to use for a certain purpose, such as treating a disorder. To use the cross-reference, first find the purpose in the list, then read across for the suggested supplements. For more information on the supplements, look them up alphabetically in Chapter 5 (individual nutrients and herbs) and Chapter 6 (combination supplements).

Age-related cognitive decline. See Ginkgo biloba; Phosphatidylserine; Vinpocetine.
Allergies. See Grape seed extract; Hesperidin; Quercetin; Spirulina; Stinging nettle leaf.
Allergies. food. See Probiotics.
Alzheimer’s disease. See Acetyl-L-carnitine; CDP-choline; Choline: Folic acid; Ginkgo biloba; Huperzine A; Lecithin; Phosphatidylcholine; Phosphatidylserine; Thiamine (vitamin B1); Vitamin E; Zinc.
Anemia, iron deficiency. See Iron.
Anemia, pernicious. See Vitamin B
Angina, hypertension. See CoQ10.
Anti-aging. See 7-keto DHEA; Acetyl-L-carnitine; Carnosine; Cordyceps; DHEA; Ginseng; Grape seed extract; Huperzine A; Lipoic acid; Vitamin E.
Anxiety. See 5-HTP; Inositol; Kava kava: St. John’s wort; Theanine.
Appetite, loss of. See Devil’s claw; Fenugreek.
Arthritis. See Alkylglycerol; Ashwagandha; Boron; Boswellia; Bovine cartilage; Bromelain; Cartilage; Cat’s claw; Cetyl myristoleate (CMO); Chondroitin; Curcumin; Devil’s claw; Flaxseed oil; Ginger; Glucosamine; Grape seed extract; Green tea extract; Green-lipped mussel extract; Propolis; Sea cucumber; Stinging nettle leaf.
Arthritis. osteo. See Manganese; Nicinamide (vitamin B3).
Arthritis, rheumatoid. See Borage oil; Evening primrose oil; Fish oil; Pantothenic acid (vitamin B5).
Asthma. See Beta-carotene; Boswellia; Bromelain; Coleus forskohlii; Cordyceps; Ginkgo biloba; Magnesium; Pyridoxine (vitamin Be); Quercetin; Vitamin C; Vitamin E.
Asthma, sulfite sensitivity. See Molybdenum.
Athletic performance. See Arginine; Carnitine; Conjugated linoleic acid (CLA): Cordyceps; Creatine; Ginseng; Glutamine; HMB (beta-Hydroxy beta-MethylButyrate); Ornithine, Ornithine alpha-ketoglutarate (OKG); Pyruvate; Siberian ginseng.
Autism. See Pyridoxine (vitamin Be).
Benign prostatic hypertrophy. See Beta-sitosterol; Flower pollen; Genistein; Pygeum; Saw palmetto: Stinging nettle root; Zinc.
Bronchitis. See N-acetyl cysteine (NAC); Vitamin A.
Burns. See Aloe vera gel.
Bursitis. See Willow bark.
Cancer. See Alkylglycerol; Astragalus; Beta-1,3-glucan; Beta-carotene: Bovine cartilage; Broccoli extract; Cartilage; Cat’s claw; Chlorophyll; Conjugated linoleic acid (CLA); Cordyceps; Coriolus versicolor extract (PSK); Curcumin; Folic acid; Garlic; Ginseng; Glutathione; Grape seed extract; Green foods; Green tea extract; Lycopene; Maitake mushroom; Molybdenum; Polyphenols; Selenium; Soy isoflavones: Theanine; Vitamin A; Vitamin C.
Cancer, breast. See Genistein; Indole-3-carbinol; Siberian ginseng; Tocotrienols.
Cancer, cervical. See Indole-3-carbinol.
Cancer, colon. See Calcium; Fiber; FOS (fructo-oligosaccharides).
Cancer, prostate. See Genistein: Green tea extract; Lycopene; Modified citrus pectin; Shiitake mushroom; Zinc.
Candidiasis. See Barberry; Caprylic acid; Probiotics; Rosemary leaf.
Canker Sores. See Deglycyrrhizinated licorice (DGL); Goldenseal; Oregon grape; Riboflavin (vitamin B2).
Cardiovascular disease. See Acetyl-L-carnitine; Arginine; Beta-carotene; Betaine; Bilberry; Black currant seed
oil; Carnitine; CDP-choline: Coleus forskohlii; Conjugated linoleic acid (CLA); Copper; CoQ10 Creatine; Curcumin; Fiber; Fish oil; Folic acid; Garlic; Grape seed extract; Green tea extract; Hawthorn; Hesperidin; Lycopene; Magnesium: N-acetyl cysteine (NAC); Pantethine: Phytosterols and phytostanols; Polyphenols: Potassium; Pyridoxine (vitamin BE); Quercetin; Resveratrol; Selenium; Soy isoflavones; Soy protein; Vitamin B12; Vitamin C; Vitamin E.

Carpal tunnel syndrome. See Pyridoxine (vitamin B6).
Cataracts. See Beta-carotene; Bilberry; Curcumin; Glutathione: Grape seed extract; Lutein; Pantethine; Quercetin; Selenium; Vitamin C; Zeaxanthin.
Cholesterol problems. See Artichoke leaf; Ascorbyl palmitate; Beta-1,3-glucan: Beta-sitosterol; Betaine; Carnitine: Chitosan; Choline; Chromium: Chromium picolinate; Chromium policynicotinate; Fenugreek: Fiber; Flaxseed oil; Garlic; Genistein; Guggul; Hawthorn; Hesperidin; Lecithin: Lycopene; Niacin (nicotinic acid, vitamin B3); Niacin, no-flush; Pantethine; Pectin; Phosphatidylcholine: Phytosterols and phytostanols; Polyphenols; Psyllium seed: Red yeast rice; Resveratrol; Royal jelly: Soy isoflavones; Soy protein; Spirulina; Tocotrienols; Vitamin C.
Chronic fatigue syndrome. See Cordyceps; DHEA; Ginseng; Magnesium; Siberian ginseng; Thiamine (vitamin B1); Vitamin B12.
Chronic venous insufficiency. See Butcher’s broom: Grape seed extract: Horse chestnut.
Cirrhosis, liver. See Milk Thistle.
Cold and flu. See Astragalus; Echinacea; Elderberry; Ephedra (ma huang); Ginseng; Siberian ginseng; Vitamin C; Zinc.
Cold sores. See Lysine.
Congestive heart failure. See Taurine.
Crohn’s disease. See Boswelia: Cat’s claw: Fish oil: Vitamin D.
Cystic fibrosis. See Taurine: Vitamin A; Vitamin D.
Depression. See 5-HTP: DL-Phenylalanine (DLPA); Inositol; Phosphatidylserine; SAMe: St. John’s wort; Tyrosine.
Depression, from oral contraceptives or PMS. See Pyridoxine (vitamin B6).
Diabetes. See Aloe vera gel juice; Bilberry: Biotin (vitamin H); Carnitine; Chromium: Chromium picolinate; Chromium policynicotinate; Conjugated linoleic acid (CLA); Evening primrose oil; Fenugreek: Ginseng: Glutathione: Gymnema sylvestre; Inositol; Lipoic acid; Magnesium; Niacinamide (vitamin B3); Psyllium seed; Siberian ginseng; Reishi; Thiamine (vitamin B1); Vitamin E.
Diabetic neuropathy. See Black currant seed oil: Lipoic acid.
Diarrhea. See Bromelain; Colostrum; Fiber: FOS (fructo-oligosaccharides); Probiotics; Psyllium seed.
Digestive aid. See Bromelain; Curcumin: Peppermint oil; Down syndrome. See Acetyl-L-carnitine.
Eczema. See Borage oil; Evening primrose oil.
Energy. See 7-keto DHEA.
Energy, low. See Carnitine Cordyceps; Ginseng; Siberian ginseng.
Epilepsy. See Taurine.
Erectile dysfunction. See Arginine: Ginkgo biloba Ginseng.
Fertility, male. See Arginine; Ginseng; Zinc.
Fibrocystic breast disease. See Chaste tree berry: Evening primrose oil; Iodine.
Fibromyalgia. See 5-HTP; Cetyl myristoleate (CMO): SAMe: Thiamine (vitamin B1).
Fungal infections, topical. See Oregano oil; Tea tree oil.
Gastroesophageal Reflux Disease (GERD). See Deglycyrrhizinated licorice (DGL).
Gastrointestinal disorders. See Aloe vera gel juice; FOS (fructo-oligosaccharides); Ginger; Glutamine; Gold-
enseal; Oregon grape; Probiotics; Rosemary leaf; Vitamin B12.

Glaucoma. See Coleus forskohlii; Lipoic acid.

Goiter. See Iodine.

Hair, Skin, and Nails. See Horsetail; Orthosilicic acid; Silicon.

Headaches. See 5-HTP; Rosemary leaf.

Healing. See Glutamine.

Helicobacter pylori. See Vitamin C.

Hemorrhoids. See Bilberry; Butcher’s broom; Grape seed extract; Hesperidin; Horse chestnut.

Hepatitis. See Astragalus; Choline; Milk thistle; N-acetyl cysteine (NAC); Phosphatidylcholine.

Herpes simplex virus. See Lysine.

HIV. See Alkylglycerol; Beta-carotene; Cat’s claw; Glutathione; Maitake mushroom; Selenium; Shiitake mushroom.

Hypertension. See Calcium; Fish oil; Garlic; Hawthorn; Magnesium; Olive leaf extract; Potassium; Reishi.

Hypoglycemia. See Chromium; Chromium picolinate; Chromium polynicotinate.

Hypothyroidism. See Iodine.

Immune system. See Alkylglycerol; Ashwagandha; Astragalus; Barberry; Beta-1,3-glucan; beta-carotene; Cat’s claw; Chlorophyll: Colostrum; Coriolus versicolor extract (PSK); Curcumin; Echinacea; Elderberry; FOS (fructo-oligosaccharides); Garlic; Ginseng; Glutamine; Green foods; Larch, western; Maitake mushroom; N-acetyl cysteine (NAC); Olive leaf extract; Oregon grape; Probiotics; Propolis; Pyridoxine (vitamin B6); Reishi; Resveratrol; Rosemary leaf; Selenium; Shiitake mushroom; Siberian ginseng; Spirulina; Vitamin A; Vitamin E; Whey protein; Zinc.

Indigestion. See Artichoke leaf; Bromelain; Devil’s claw; Rosemary leaf.

Infertility. See Acetyl-L-carnitine; Chaste tree berry

Infertility, male. See Glutathione.

Insomnia. See 5-HTP; Kava kava; Melatonin; Valerian root.

Intermittent claudication. See Ginkgo biloba; Niacin. (nicotinic acid, vitamin B3); Niacin, no-flush.

Irritable bowel syndrome. See Artichoke leaf; Boswellia; Cat’s claw; Fiber; FOS (fructo-oligosaccharides); Peppermint oil; Psyllium seed.

Jet lag. See Melatonin.

Kidney stones. See Chlorophyll; Cranberry; Stinging nettle leaf.

Leg cramps. See Horse chestnut.

Leukoplakia. See Beta-carotene.

Liver disorders. See Artichoke leaf; Astragalus; Betaine; Choline; Inositol; Lecithin; N-acetyl cysteine (NAC); Phosphatidylcholine; SAMe; Shiitake mushroom; Spirulina; Taurine.

Low immune system. See 7-keto DHEA.

Lung disease. See N-acetyl cysteine (NAC).

Macular degeneration. See Beta-carotene: Bilberry; Ginkgo biloba: Grape seed extract; Lutein; Vitamin A; Zeaxanthin; Zinc.

Malabsorption conditions. See Vitamin B12; Vitamin K.

Manic depression. See Choline: Phosphatidylcholine.

Menopause. See Black cohosh; Chaste tree berry; genistein; Soy isoflavones.

Menstrual irregularities. See Chaste tree berry.

Mental function. See Choline; Huperzine A; Phosphatidylcholine; Vinpocetine.

Migraine headaches. See 5-HTP; Feverfew; Magnesium; Riboflavin (vitamin B2).

Multiple sclerosis. See Thiamine (vitamin B1).

Muscle spasm. See Kava kava.

Nausea. See Ginger.
Nausea, morning sickness. See Pyridoxine (vitamin B6).
Nervousness. See Kava kava.
Neuropathies. See Acetyl-L-carnitine.
Night blindness. See Beta-carotene; Grape seed extract; Vitamin A; Zinc.
Nutritional support. See Copper; Glutamine: Green foods; MCT (Medium Chain Triglycerides); Soy protein; Vitamin K; Whey protein.
Nutritional support, for the elderly. See riboflavin (vitamin B2); Thiamine (vitamin B1): Vitamin B12.
Obesity. See 5-HTP; 7-Keto DHEA; Ephedra (ma huang); Garcinia cambogia; Green tea extract; Pyruvate.
Obsessive-compulsive disorder. See Inositol.
Odor. See Chlorophyll.
Osteomalacia. See Vitamin D.
Osteoporosis. See Black cohosh; Boron; Calcium; Ipriflavone; Magnesium; Manganese; Orthosilicic acid; Silicon; Vitamin D; Vitamin K.
Pain. See DL-Phenylalanine (DLPA); Kava kava: Willow bark.
Parasites. See Garlic; Goldenseal; Oregon grape.
Parkinson’s disease. See CDP-choline: Choline; Phosphatidylcholine; Phosphatidylserine.
Periodontal disease. See CoQ10; Cranberry.
Pregnancy. See Folic acid.
Premenstrual syndrome. See Black cohosh; Chaste tree berry; Evening primrose oil; Pyridoxine (vitamin B1).
Prostatitis. See Flower pollen: Pygeum; Quercetin; Stinging nettle root.
Psoriasis. See Alkylglycerol; Aloe vera gel; Barberry; Coleus forskohlii; Fish oil; Oregon grape.
Raynaud’s phenomenon. See Niacin (nicotinic acid, vitamin B3); Niacin, no-flush.
Retinopathy. See Bilberry: Ginkgo biloba; Grape seed extract.
Seasonal affective disorder. See 5-HTP; St. John’s wort.
Sexual performance. See 7-Keto DHEA; DHEA; Yohimbe bark; Zinc.
Shingles. See Lysine.
Sinusitis. See Bromelain; Ephedra (ma huang).
Skin conditions, topical. See Ascorbyl palmitate; Vitamin E.
Skin disorders. See Biotin (Vitamin H); Borage oil; Evening primrose oil; Oregon grape; Pantothenic acid (vitamin B5): Vitamin A.
Sports injuries. See Boswellia: Bromelain; Chondroitin; Devil’s claw; Glucosamine; Grape seed extract; Sea cucumber; Willow bark.
Stress. See 7-Keto DHEA: Ashwagandha; Astragalus; Kava kava; Pantothenic acid (vitamin B5); Siberian ginseng; Vitamin C.
Stroke. See Garlic: Vinpocetine.
Tardive dyskinesia. See Choline; Phosphatidylcholine.
Tinnitus. See Ginkgo biloba; Vinpocetine; Vitamin B12.
Triglycerides, high. See Carnitine: Chromium; Chromium picolinate; Chromium polynicotinate; DHA (docosahexaenoic acid); Fish oil: Flaxseed oil; Garlic.
Ulcer, peptic. See Carnosine; Deglycyrrhizinated licorice (DGL).
Ulcerative colitis. See Boswellia; Fish oil.
Urinary tract infections. See Barberry; Cranberry: Horsetail; Uva ursi.
Varicose veins. See Bilberry: Butcher’s broom; Grape seed extract; Hesperidin; Horse chestnut.
Ventricular arrhythmias. See Barberry.
Vertigo. See Ginkgo biloba.
Vision problems. See Grape seed extract; Vitamin A.
Weight loss. See 7-Keto DHEA; Carnitine; Chitoan; Chromium; Chromium picolinate; Chromium polynicotinate;
Colostrum; Conjugated linoleic acid (CLA); Ephedra (ma huang); Garcinia cambogia; Green tea extract; Psyllium seed; Pyruvate.

Wound healing. See Aloe vera gel; Arginine; Ornithine, Ornithine alpha-ketoglutarate (OKG); Zinc.