Fundamental Nutrition Products -- multivitamin/mineral, essential fatty acids (EPA/DHA), calcium, vitamins B, C, D & E, other antioxidants, phytonutrient complex, prebiotics, fiber, probiotics

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A good foundational nutritional support program starts with the intake of essential vitamins and minerals, fiber and essential fatty acids. We offer a variety of fundamental nutritional formulas to address healthy and balanced individual health needs.

Eating a balanced diet is of paramount importance for our health, but actually consuming this mythical "balanced diet" is often easier said than done. Mass-produced foods are often heavily processed, losing essential nutrients in the process. Agricultural techniques for generating the greatest possible yields can mean that even fresh foods may not contain all the vitamins and minerals they should. Add to this the time required to prepare food and the allure of fast food restaurants, and it is a struggle for most of us to get all the nutrients our bodies need.

This doesn't mean we should just toss the notion of eating well out of the window. Even with the challenges involved, a balanced diet is still the best way to maintain health, energy and an appropriate weight. Health supplements won't replace a balanced diet, but they will make up for the missing vitamins and minerals in our often inadequate diets.

FUNDAMENTAL NUTRITITION

Vitamins and minerals are necessary for normal metabolism and good health. Vitamins and minerals have no calories and are not an energy source, but assist and regulate metabolizing nutrients in food, help convert fat and carbohydrates into energy and are invaluable in keeping your body running smoothly. Vitamins make it possible for other nutrients to be digested, absorbed and metabolized by the body. Vitamins are sometimes referred to as the "spark plugs" of our human machine. They are required to do many things and when we are sick, dieting, taking medications or living an unhealthy life with bad habits, your body will become depleted of certain essential vitamins which can lead to acute and chronic disease. Vitamins promote normal growth assisting the formation of bone and tissue, provide proper metabolism, ensure good health and protect against certain diseases, and assist in the

formation of hormones, blood cells, nervous-system chemicals, and genetic material. Vitamins mainly serve as catalysts for certain reactions in the body. They combine with proteins to create metabolically active enzymes that in turn produce hundreds of important chemical reactions throughout the body.

There are plenty of multivitamin benefits when you are building your body through weight training or cardiovascular exercise. When you are on a low calorie diet or lifting weights for gaining muscle mass, it is hard to get the right amount of vitamins and minerals from the food you eat. Not only do you need vitamins and minerals to keep your body running well, they are also important for growth and maintenance of your muscles. Plus, vitamins and minerals aid in the loss of stubborn body fat by boosting your metabolism. The benefits of multivitamins will take your bodybuilding routine to the next level. Of course there are many more vitamins and minerals that play a role in the success of your weight management but, these are the major ones that have a great impact in muscle growth and metabolism.

Vitamins can be divided into two broad categories: fat-soluble and water-soluble.

Fat-soluble vitamins

The fat soluble vitamins are soluble in lipids (fats). These vitamins are usually absorbed in fat globules that travel through the lymphatic system of the small intestines and into the general blood circulation within the body. These fat soluble vitamins (A,D,E, and K), are then stored in body tissues. Fat-soluble vitamins are then dissolved in fat before they are absorbed back into the blood stream to carry out their functions. Excesses of these vitamins are stored in the liver. But be careful: Because they are stored, overdoes of these vitamins can lead to toxicity. Persons can also be deficient in the fat soluble vitamins if their fat intake is too low or if their fat absorption is compromised, for example, by certain drugs or by certain diseases.

Vitamin A

Vitamin A plays an important role in vision, immune function, and maintenance of mucus forming cells, bone growth, reproduction, cell division and differentiation. Vitamin A is involved in the production of Glycogen, the body's storage form of energy for high intensity performance. Vitamin A will help keep your anabolic hormones at optimal levels, allowing for greater increases in lean muscle weight and strength. While ensuring a good supply of all of the fat soluble vitamins is crucial to good health, Vitamin A is particularly important in raising testosterone levels in the body. As well as being able to increase testosterone level naturally, Vitamin A is crucial in optimizing protein utilization, and can therefore help you to build and repair muscle more quickly.

When building lean muscle mass, the goal is for the protein from the food you eat to go to your muscles. Without vitamin A, 60 percent of the protein you digest will go to waste. When you want to gain muscle mass fast, vitamin A will help. Vitamin A also helps in the breaking down of the muscle cells and the transformation of protein into muscle. When you workout, the cells in your muscles needs to be broken down and split. This vitamin will help in that process. Once the muscle cells are broken down, they are ready for the protein to be shuttled into the damaged muscle for repair. The transformation of protein turning into muscle will be aided greatly by a sufficient amount of vitamin A.

Vitamin A coupled with iron supplementation will increase lean body mass by improving anabolic hormone status i.e. increased ‘available’ testosterone, igf-1 and growth hormone levels. Vitamin A status is not only essential to increase testosterone level naturally, but it will also lower estrogen levels!

Controlling your estrogen levels is one of the most effective ways to lose fat, so as well as helping you to build muscle Vitamin A could help you to lean down as well.

When looking for foods to eat with Vitamin A, try cod liver oil, orange vegetables, or oranges.

The recommended daily allowance for vitamin A is 5000 international units (IU) (1,000 µg retinol equivalent- RE) for adults although *10,000 IU* per day is normally used in supplementation and 8000 IU for pregnant or lactating women. Be aware that this dosage is the minimum that you require per day, to ward off serious deficiency of this particular nutrient. In the therapeutic use of this nutrient, the dosage is usually increased considerably, but the toxicity level must be kept in mind. Pregnant women must be careful as a high intake of this vitamin can cause birth defects.

Dosages exceeding 15,000 IU per day must be taken under medical supervision. Toxicity can appear in some individuals at relatively low dosages and the symptoms may include nausea, dizziness, menstrual problems, skin changes and dryness, itchiness, irritability, vomiting, headaches and long term use can cause hair loss, bone and muscle pain, headache, liver damage, and an increase in blood lipid concentrations. Pro-vitamin A - beta-carotene does not cause toxicity.

Vitamin D3

Vitamin D is a group of fat-soluble vitamins of which the two major physiologically relevant forms are vitamin D_2 and vitamin D_3. Vitamin D without a subscript refers to either D_2 or D_3 or both. Vitamin D_3 is produced in the skin of vertebrates after exposure to ultraviolet B light from the sun or artificial sources, and occurs naturally in a small range of foods. In some countries, staple foods such as milk, flour and margarine are artificially fortified with vitamin D, and it is also available as a supplement in pill form. Food sources such as fatty fish, mushrooms, eggs, and meat are rich in vitamin D and are often recommended for consumption to those suffering a deficiency.

Vitamin D plays a crucial role in support and function of bone, cardiovascular, immune, and neurological health by regulating the absorption of Calcium and Phosphorus. Calcium is necessary for muscular contraction. If adequate stores of Calcium are not available in the muscle, full, hard muscular contractions cannot be sustained. Of course, Calcium is also needed for the integrity of bones, which must support increased muscle tissue and provide an anchor during muscular contraction. Phosphorus helps provide quick, powerful muscular contractions, which comprise the majority of movements during weight training. Phosphorus is also required for the synthesis of ATP, the high energy molecule used by your muscle cells during contraction.

Your own vitamin D reserves depend mainly on how much sunlight reached the deeper levels of your skin during the last two or three months, and how much vitamin D you took by mouth during this period. To be sure of your own current vitamin D status, you can take a vitamin D blood test called the 25(OH)D test.

The current recommendation for adult intake of vitamin D is 400 IU per day, but findings from a study published in the Journal of Internal Medicine suggested that a vitamin D intake of 600 IU was insufficient to maintain adequate vitamin D levels in the body in the absence of sun exposure. They proposed an increase of the minimum daily recommended adult dose to 1,000 IU per day

D3 Dose for adults	**Body Mass (kg / Pounds)**			
Body mass (kg):	50-70	71-90	91-1203	> 120
Body mass (pounds):	110-155	156-199	200-264	> 265

How much strong sun?	Vitamin D3 daily supplements (IU)			
No Sun	3500	5000	6500	7500
A little on most days	3000	4000	5000	6000
Lots (outdoor type)	1500	2000	2500	3000

Vitamin E

Vitamin E is the most effective, fat-soluble antioxidant known to occur in the human body which plays a role in the aging process. The main function of vitamin E is to maintain the integrity of the body's intracellular membrane by protecting its physical stability and providing a defense line against tissue damage caused by oxidation. This is important because many of the metabolic processes that take place in the body, including the recuperation and growth of muscle cells, are dependent upon healthy cell membranes. Antioxidants reduce the number of free radicals in the body. Free radicals are natural byproducts of cellular respiration, but accumulation of free radicals can lead to cellular changes and destruction (even cancer), rendering cells unable to adapt normally. This means a reduction in exercise induced processes in the cell such as repair and growth.

The recommended dietary allowance (RDA) for vitamin E is quite low, 15 mg to 20 International Units (IU) per day. The most commonly prescribed dosage of supplemental vitamin E for adults is approximately *300 to 800 IU* per day. However, many researchers believe that 100 to 200 IU per day is sufficient and that any dosage in excess of this amount provides little additional value.

Vitamin K

One of the fat-soluble vitamins needed for the clotting of blood because of an essential role in the production of prothrombin. Vitamin K also plays an important role in bone metabolism. Vitamin K supplements may improve bone mass in postmenopausal women. Vitamin K prevents calcification of arteries and other soft tissue. Calcification of organs and other soft tissue is an adverse consequence of aging. Vitamin K may play a role in the regulation of blood sugar. The pancreas, which makes insulin, has the second highest amount of vitamin K in the body. There isn't enough scientific information to determine recommended dietary allowances (RDAs) for vitamin K, so daily adequate intake (AI) recommendations have been formed instead: The AIs are: infants 0-6 months, 2 mcg; infants 6-12 months, 2.5 mcg; children 1-3 years, 30 mcg; children 4-8 years, 55 mcg; children 9-13 years, 60 mcg; adolescents 14-18 years (including those who are pregnant or breast-feeding), 75 mcg; men over 19 years, 120 mcg; women over 19 years (including those who are pregnant and breast-feeding), 90 mcg.

The water-soluble vitamins

Water-soluble vitamins dissolve in water and are not stored; they are eliminated in urine. We need a continuous supply of them in our diets. The water-soluble vitamins are vitamin C and the B-complex vitamins. Water-soluble vitamins are easily destroyed or washed out during food storage or preparation. Proper storage and preparation of food can minimize vitamin loss.

Vitamin B Complex

Each member of the B-complex - thiamine (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), pyridoxine (B6), biotin (B7), folic acid or folate (B9), cobalamin (B12) -has a unique structure and performs unique functions in the human body. Vitamins B1, B2, B3, and biotin participate in different aspects of energy production, vitamin B6 is essential for amino acid metabolism, and vitamin B12 and folic acid facilitate steps required for cell division.

These Vitamins are essential for:

The breakdown of carbohydrates into glucose (this provides energy for the body). The breakdown of fats and proteins; converts your stored fat cells into energy. Instead of using other means of energy, vitamin B complex makes use of your stored energy and uses it for energy. This in turn, helps you lose that stubborn belly fat faster when working out. Vitamin B complex also manages your body metabolism for the digestion of protein.

B vitamins are vital for clear, luminous skin, youthful looks and for delaying graying of hair. They are essential for healthy skin, hair, and eyes. Studies show that 40 percent of dermatitis sufferers lack B vitamins. B vitamins also counteract stress, which has adverse effects on one's appearance.

Vitamin B complex reduces muscle spasms, leg cramps, hand numbness and helps regulate blood pressure. Finally, this vitamin helps in the transformation of certain substances from your body and turns that into insulin and growth hormones that are essential for energy and faster muscle growth.

Supplement with a high quality *Vitamin B (100)* complex that includes all the B vitamins at the appropriate ratios; these ratios are compared to the B6 at *100 mg* per day. This is recommended for promoting optimal health and immune function, weight loss and increase ATP production (energy). You will get a lot of multivitamins benefits from the Vitamin B complex.

Thiamine (vitamin B1) -Thiamine is one of the vitamins required for protein metabolism and growth. It's also involved in the formation of hemoglobin, a protein found in red blood cells that transports oxygen throughout the body (especially working muscles). The removal of carbon dioxide and transport of oxygen is critical to athletic performance and becomes even more important as intensity and duration of exercise increase. Thiamin plays a vital role in the synthesis of neurotransmitters, which are the important for communication between nerve tissues.

Making matters more interesting, Thiamine, according to research, is one of the few vitamins that enhance performance when supplemented and is increasingly needed by athletes. Not only that, but Thiamine requirements appear to be directly related to caloric expenditure. The more exercise frequency, intensity and duration increase, the more Thiamine is needed.

Riboflavin (vitamin B2) - Riboflavin is involved in the metabolic pathways to produce energy in three areas: 1) Glucose metabolism, 2) Oxidation of fatty acids, and 3) The shuttling of hydrogen ions through the Krebs cycle. Of particular interest to weight management, Riboflavin is somewhat related to protein metabolism. In fact, there is a strong relationship between lean body mass and dietary riboflavin.

One study by Belko and colleagues found that females needed higher than RDA levels of Riboflavin to return blood levels of Riboflavin to normal after exercise. Another study by Haralambie showed that Riboflavin supplementation improved muscular hyperexcitability. This vitamin may prove to be especially important for athletes.

Niacin (vitamin B3) - This vitamin is involved in nearly 60 metabolic processes related to energy production and ranks high for weight management by virtue of its critical importance in providing the fuel to train. Niacin works closely with vitamin B1, vitamin B2, vitamin B6, pantothenic acid, and biotin to breakdown the carbohydrates, fats, and proteins in food into energy. It also aids in the production of hydrochloric acid, needed for proper digestion. Niacin plays an important role in ridding the body of toxic and harmful chemicals. It also helps the body make various sex and stress-

related hormones in the adrenal glands and other parts of the body. Vitamin B3 is essential for the activity of many enzymes in the body helping lower cholesterol by preventing its buildup in the liver and arteries, promoting healthy skin and the health of the myelin sheath (the protective covering of the spinal nerves) and is an aid in protecting the pancreas. Niacin releases histamine that dilates the blood vessels and this flushing aids circulation. Bodybuilders are familiar with the form of Niacin known as nicotinic acid, which causes vasodilation and may help a competitor look more vascular before going onstage. But this form of Niacin shouldn't be used during training; large doses of nicotinic acid (50 - 100 mg) may significantly impair the body's ability to mobilize and burn fat.

Pantothenic acid (vitamin B5) - Pantothenic acid is an antioxidant water-soluble vitamin needed in the synthesis and break down of carbohydrates, proteins, and fats. Vitamin B5 is essential for human growth, reproduction and many normal bodily processes. Vitamin B5 helps metabolize nutrients, manufacture antibodies and produce vitamin D. Pantothenic acid plays a role in the synthesis of cholesterol, hemoglobin, steroid hormones, neurotransmitters, and lipids.

Biotin (Vitamin B7) - is necessary for cell growth, the production of fatty acids, and the metabolism of fats and amino acids. It plays a role in the citric acid cycle, which is the process by which biochemical energy is generated during aerobic respiration. Biotin not only assists in various metabolic reactions but also helps to transfer carbon dioxide. Biotin may also be helpful in maintaining a steady blood sugar level. Biotin is often recommended for strengthening hair and nails. As a consequence, it is found in many cosmetics and health products for the hair and skin, though it cannot be absorbed through the hair or skin itself.

Pyridoxine (Vitamin B6) - Vitamin B6 (pyridoxine) in needed for ***more than 100 enzymes*** and is essential for protein and carbohydrate metabolism and the synthesis of hormones, insulin, red and white blood cells. Vitamin B6, through its involvement in protein metabolism and cellular growth, is important to the immune system. It helps maintain the health of lymphoid organs (thymus, spleen, and lymph nodes) that make your white blood cells. Vitamin B6 is required for maintaining a healthy nervous system in the production of serotonin, other neurotransmitters and prostaglandins; and it is also needed for the conversion of tryptophan (an amino acid) to niacin. Vitamin B6 also helps maintain your blood glucose (sugar) within a normal range. When caloric intake is low your body needs vitamin B6 to help enzyme systems such as CoQ-10 and glycogen phosphorylase convert stored carbohydrate or other nutrients stored in the muscle as glycogen to glucose to maintain normal blood sugar levels.

Protein metabolism, growth and carbohydrate utilization are all made possible in part by the presence of vitamin B6. Like Thiamine, studies on Pyridoxine in athletic performance show a definite increased need for athletes and performance enhancement from supplementation. Vitamin B6 is the most commonly deficient B vitamin. The body may become easily depleted of Vitamin B6 due to the body's high Vitamin B6 demand and drug, environmental and lifestyle interactions causing depletions.

Folic Acid (vitamin B9) - Folic acid is essential to numerous bodily functions ranging from synthesizing DNA, repairing DNA, and DNA methylation as well as to act as a cofactor in biological reactions involving folate. It is especially important during periods of rapid cell division and growth. Children and adults both require folic acid to produce healthy red blood cells and prevent anemia. Folate and folic acid derive their names from the Latin word *folium* (which means "leaf"). Leafy green vegetables, nuts, whole grains, legumes, are a principal source, although, in Western diets, fortified cereals and bread may be a larger dietary source. However, bear in mind that folic acid is lost when foods are stored at room temperature or cooked.

A lack of dietary folic acid leads to folate deficiency (FD). This can result in many health problems, the most notable one being neural tube defects in developing embryos. Low levels of folate can also lead to homocysteine accumulation as a result of the impairment of one-carbon metabolism mechanism methylation. DNA synthesis and repair are impaired and this could lead to cancer development.
A 2010 opinion article in the *New York Times* named micronutrients, especially folic acid, the "world's most luscious food," since absence of folic acid and a handful of other micronutrients causes otherwise preventable deformities and diseases, especially in fetal development. Folic acid can be used to help treat Alzheimer's disease, depression, anemia, and certain types of cancer. Deficiency is rare, although folic acid is particularly important in pregnancy. Consuming adequate folic acid before and during pregnancy helps prevent neural tube defects in newborns, including spina bifida.

Cobalamin (vitamin B12) - Although the functions of vitamin B12 are numerous, it plays a key role in the normal functioning of the brain and nervous system, and for the formation of blood. It is normally involved in the metabolism of every cell of the human body, especially affecting DNA synthesis and regulation, but also fatty acid synthesis and energy production. To the athlete and physically active individual, Vitamin B12 is very important for carbohydrate metabolism and maintenance of nervous system tissue (insulates the nerve fibers of the spinal cord and nerves that carry signals from the brain to muscle tissues). Stimulation of muscles via nerves is a critical step in the contraction, coordination and growth of muscles.

As the largest and most structurally complicated vitamin, it can be produced industrially only through bacterial fermentation-synthesis. Vitamin B12 is available only from foods of animal origin; therefore, it is very important for individuals following a strict vegetarian diet to consult a physician about vitamin B12 supplementation. In fact, B12 shots are popular with countless athletes and vegetarians alike, many of who swear it helps them perform better.

Vitamin C

Vitamin C is responsible for helping to build and maintain all living tissues and strengthening our immune system and especially important in wound-healing and in preventing bleeding from capillaries. Vitamin C is essential to prevent free radical damage, which is accelerated after injuries, sickness and the trauma of weight training, thus enhancing recovery and growth. It is also essential in helping to repair the connective tissue. Ascorbic Acid is involved with amino acid metabolism, especially the formation of Collagen. Collagen is the primary constituent of connective tissue, the stuff that holds your bones and muscles together. This may not seem important, but if you are active, get injured easily or physically train often or lift heavier weights, the stress you put on your structure becomes tremendous. If your connective tissue is not as healthy and strong as it should be, risk of injury dramatically increases.

Vitamin C takes the cholesterol that you digest from your body and transforms it into a natural steroidal hormone that the body uses for gaining muscle mass – very important with increasing your basal metabolic rate. Ascorbic acid also assists in the formation and release of steroid hormones, including the anabolic hormone testosterone. It is a natural process in your body that helps build muscles and helps in the recovery of your muscles.

Third, vitamin C helps in the absorption of Iron. Iron is necessary to help oxygen bind to hemoglobin in blood. Without adequate oxygen transportation in blood, muscles are robbed of precious oxygen and energy and performance is greatly reduced.

Finally, vitamin C is perhaps the most water soluble vitamin there is. In other words, it diffuses very rapidly in water. Since a muscle cell is mostly water, the more muscular an athlete becomes, the more vitamin C disperses and the lower the concentration of this critical substance becomes in body tissues. So vitamin C requirements are greatly increased for those that weight train and exercise on a structured diet. The RDA is a mere 60mg's which in my opinion is way too low for a normal person let alone a physically active individual or bodybuilder or someone trying to lose weight. Many Doctors and nutritionists also think that 60mg's is too low and tend to lean towards suggestion *1000-3000 mg's* is a range to experimenting with Vitamin C amounts. You could try a little more and see if you notice and difference in recovery. Remember, Vitamin C is water soluble, so any extra will just wash out of your system with your fluids.

Minerals

Sodium

Sodium is a critical electrolyte, vital to human life. Together with potassium and chlorine, it forms a very important part of blood plasma. Sodium also allows our bodies to maintain the right blood chemistry and the correct amount of water in our blood. This element is critical to normal functioning of our nervous system to transport signals with the nerves and our muscles to contract and relax normally. Furthermore, our bodies need sodium to digest the food that we eat.

Most Americans consume more salt than they need. Recent research has shown that people consuming diets of 1,500 mg of sodium demonstrated lower blood pressure then individuals consuming the average American diet. Many endurance athletes will require much more sodium and chloride; particularly for athletes with high sweat losses. Sports drinks containing sodium and potassium as well as carbohydrates, are recommended for these individuals, especially in endurance events greater than two hours in duration.

Potassium

Potassium is a very important mineral for the proper function of all cells, tissues, and organs in the human body. It is also an electrolyte, a substance that conducts electricity in the body, along with sodium, chloride, calcium, and magnesium. Potassium is crucial to heart function and plays a key role in skeletal and smooth muscle contraction and the strength of muscle contraction, making it important for normal digestive and muscular function, too. Many foods contain potassium, including all meats, some types of fish (such as salmon, cod, and flounder), and many fruits, vegetables, nuts/seeds, whole grains and legumes. Dairy products are also good sources of potassium. Most people get all of the potassium they need from a healthy diet rich in vegetables and fruits. During intense exercise, plasma potassium concentrations tend to decline to a lesser degree than sodium.

In 2004, the Institute of Medicine at the National Academy of Sciences issued new Adequate Intake (AI) levels for potassium. The recommendations are as follows:

- 0-6 months: 400 mg
- 6-12 months: 700 mg
- 1-3 years: 3.5 g
- 4-8 years: 3.8 g
- 9-13 years: 4.5 g
- 14-18 years: 4.5 g
- 19-30 years: 4.7 g

- 31-50 years: 4.7 g
- 51+ years: 4.7 g
- Pregnant women: 4.7 g
- Lactating women: 5.1 g

Calcium

Calcium is especially important for growth, maintenance and repair of bone tissue, maintenance of blood calcium levels, nerve conduction, and normal blood clotting. Inadequate dietary calcium and vitamin D increase the risk of low bone mineral density and stress fractures. Female athletes are at greatest risk for low bone mineral density if energy intakes are low, dairy products and other calcium-rich foods are inadequate or eliminated from the diet, and menstrual dysfunction is present. Calcium is necessary for muscular contraction and relaxation. If adequate stores of Calcium are not available in the muscle, full, hard muscular contractions cannot be sustained.

Calcium is also stored in fat cells and plays a crucial role in regulating how fat is stored and broken down by the body. A recent study theorized that the more calcium there is in a fat cell, the more fat will burn. Calcium is no magic bullet. What the study says is that higher-calcium diets favor burning rather than storing fat. Calcium changes the efficiency of weight loss.

Supplementation with calcium and vitamin D should be determined after a thorough nutritional assessment. The FNB established RDAs for the amounts of calcium required for bone health and to maintain adequate rates of calcium retention in healthy people. They established 1.0 -1.2 g per day. The two main forms of calcium in supplements are carbonate and citrate. Calcium carbonate is more commonly available and is both inexpensive and convenient. Both the carbonate and citrate forms are similarly well absorbed, but individuals with reduced levels of stomach acid can absorb calcium citrate more easily. Other calcium forms in supplements or fortified foods include gluconate, lactate, and phosphate. Calcium from M.C.H.C. and calcium citrate are readily absorbed and utilized by the body. While other forms of calcium may halt bone loss, only M.C.H.C. has been shown to restore bone density. M.C.H.C. or microcrystalline calcium hydroxyapatite complex, prepared from raw bone, is in an extremely bioavailable form of calcium which has been used with great success in prevention and treatment of osteoporosis, to prevent and halt bone loss, and to restore bone density. Additional minerals are present in the natural ratios occurring in normal bone. Calcium citrate malate is a well-absorbed form of calcium found in some fortified juices. The body absorbs calcium carbonate most efficiently when the supplement is consumed with food, whereas the body can absorb calcium citrate equally effectively when the supplement is taken with or without food. Current supplementation recommendations for athletes, individuals with disordered eating, amenorrhea, and risk for early osteoporosis are *1500 mg* of elemental calcium.

Magnesium

Every organ in the body -- especially the heart, muscles, and kidneys -- needs the mineral magnesium. It also contributes to the makeup of teeth and bones. Most importantly, it activates enzymes, contributes to energy production, and helps regulate calcium levels as well as copper, zinc, potassium, vitamin D, and other important nutrients in the body. Magnesium plays a variety of roles in cellular metabolism (glycolysis, fat, and protein metabolism) and regulates membrane stability and neuromuscular, cardiovascular, immune, and hormonal functions.

You can get magnesium from many foods. However, most people in the United States probably do not get as much magnesium as they should from their diet. Foods rich in magnesium include whole grains,

nuts, and green vegetables. Green leafy vegetables are particularly good sources of magnesium. Too much coffee, soda, salt, or alcohol as well as heavy menstrual periods, excessive sweating, and prolonged stress can also lower magnesium levels. Symptoms of magnesium deficiency may include agitation and anxiety, restless leg syndrome (RLS), sleep disorders, irritability, nausea and vomiting, abnormal heart rhythms, low blood pressure, confusion, muscle spasm and weakness, hyperventilation, insomnia, poor nail growth, and even seizures.

Magnesium deficiency impairs endurance performance by increasing oxygen requirements to complete exercise. Athletes in weight-class and body-conscious sports, such as wrestling, ballet, gymnastics, and tennis or those on calorie restricted diets have been reported to consume inadequate dietary magnesium. In athletes with low magnesium status, supplementation is beneficial. Without magnesium, your muscles will not be able to contract to the best of their ability. It helps produce a compound called Adenosine Triphosphate (ATP) which is the prime source of energy in the muscles. Magnesium also increases your growth hormone for the recovery of physical activity.

Recommended supplemental types include magnesium citrate, magnesium gluconate, and magnesium lactate, all of which are more easily absorbed into the body than other forms. It is a good idea to take a B vitamin complex, or a multivitamin containing B vitamins, because the level of vitamin B6 in the body determines how much magnesium will be absorbed into the cells.

Pediatric

Do not give magnesium supplements to a child without a doctor's supervision.

- Infants and children up to 3 years of age: 40 - 80 mg daily
- Children 4 - 6 years of age: 120 mg daily
- Children 7 - 10 years of age: 170 mg daily

Adult

- Adolescent and adult males: 270 - 400 mg daily
- Adolescent and adult females: 280 - 300 mg daily
- Pregnant females: 320 mg daily
- Breastfeeding females: 340 - 335 mg daily

A person's need for magnesium increases during pregnancy, recovery from surgery and illnesses, and athletic training.

Phosphorus

Next to calcium, phosphorus is the most abundant mineral in the body. These two important nutrients work closely together to build strong bones and teeth. About 85% of phosphorus in the body can be found in bones and teeth, but it is also present in cells and tissues throughout the body. Phosphorus is a component of the phospholipids that form all cell membranes. Phosphorus helps filter out waste in the kidneys and plays an essential role in how the body stores and uses energy. It also helps reduce muscle pain after a hard workout. Phosphorus helps provide quick, powerful muscular contractions, which comprise the majority of movements during weight training. Phosphorus is also required for the synthesis of ATP, the high energy molecule used by your muscle cells during contraction.

Phosphorus is needed for the growth, maintenance, and repair of all tissues and cells, and for the production of the genetic building blocks, DNA and RNA. Phosphorus is also needed to help balance and use other vitamins and minerals, including vitamin D, iodine, magnesium, and zinc.

Most people get plenty of phosphorus in their diets. The mineral is found in milk, grains, and protein-rich foods. Some health conditions such as diabetes, starvation, and alcoholism can cause levels of phosphorus in the body to fall. The same is true of conditions that make it hard for people to absorb nutrients, such as Crohn's disease and celiac disease. Some medications can cause phosphorus levels to drop, including some antacids and diuretics. Symptoms of phosphorus deficiency include loss of appetite, anxiety, bone pain, fragile bones, stiff joints, fatigue, irregular breathing, irritability, numbness, weakness, and weight change. In children, decreased growth and poor bone and tooth development may occur.

Recommended dietary allowances (RDAs) for dietary phosphorous are listed below. Most people do not need to take phosphorus supplements.

Pediatric

- Infants 0 - 6 months: 100 mg daily
- Infants 7 - 12 months: 275 mg
- Children 1 - 3 years: 460 mg
- Children 4 - 8 years: 500 mg
- Children 9 - 18 years: 1,250 mg

Adult

- Adults 19 years and older: 700 mg
- Pregnant and breastfeeding females under 18 years: 1,250 mg
- Pregnant and breastfeeding females 19 years and older: 700 mg

Iron

Iron is an essential mineral that is required for human life. Much of the iron in the body is found in red blood cells used in the formation of oxygen-carrying proteins, hemoglobin and myoglobin, and for enzymes involved in energy production. Extra iron is stored in the liver, bone marrow, spleen, and muscles. Oxygen-carrying capacity is essential for endurance exercise as well as normal function of the nervous, behavioral, and immune systems. *Iron depletion is one of the most prevalent nutrient deficiencies observed among athletes, especially females*. Iron deficiency, with or without anemia, can impair muscle function and limit work capacity. The most common symptoms of anemia are weakness and fatigue -- one reason people who are iron-deficient get tired easily is because their cells don't get enough oxygen. Iron requirements for endurance athletes, especially distance runners, are increased by approximately 70%.

The high incidence of iron depletion among athletes is usually attributed to inadequate energy intake. Other factors that can impact iron status include vegetarian diets that have poor iron availability, periods of rapid growth, training at high altitudes, increased iron losses in sweat, feces, urine, menstrual blood, bleeding ulcer, foot-strike hemolysis, regular blood donation, or injury. Athletes, especially women, long-distance runners, adolescents, and vegetarians should be screened periodically to assess

and monitor iron status. Vitamin A helps mobilize iron from its storage sites, so a deficiency of vitamin A limits the body's ability to use stored iron.

Because reversing iron deficiency anemia can require 3-6 months, it is advantageous to begin nutrition intervention before iron deficiency anemia develops. The amount of iron absorbed decreases with increasing doses. For this reason, it is recommended that most people take their prescribed daily iron supplement in two or three equally spaced doses. For adults who are not pregnant, the CDC recommends taking *50 mg to 60 mg* of oral elemental iron *twice daily* for three months for the therapeutic treatment of iron deficiency anemia. Although depleted iron stores are more prevalent in female athletes, *the incidence of iron deficiency anemia in athletes is similar to that of the nonathlete female population*. Chronic iron deficiency, with or without anemia, that results from consistently poor iron intake can negatively impact health, physical, and mental performance and warrants prompt medical intervention and monitoring.

The best sources of iron are found in animal foods that originally contained hemoglobin, such as red meats, fish, and poultry. Iron in plant foods such as lentils and beans is arranged in a chemical structure called nonheme iron. In athletes who are iron-deficient, iron supplementation not only improves blood biochemical measures and iron status but also increases work capacity as evidenced by increasing oxygen uptake, reducing heart rate, and decreasing lactate concentration during exercise. There is some evidence that athletes who are iron-deficient but do not have anemia may benefit from iron supplementation. Recent findings provide additional support for improved performance (i.e., less skeletal muscle fatigue) when iron supplementation was prescribed as 100-mg ferrous sulfate for 4-6 wk.

Zinc

Zinc is an essential trace mineral, so you get it through the foods you eat. Next to iron, zinc is the most common trace mineral in the body and is found in every cell. It has been used since ancient times to help heal wounds. It plays an important role in the immune system, reproduction, growth, building and repair of muscle tissue, break down of carbohydrates into energy production, taste, vision, smell, blood clotting, and proper insulin and thyroid function. Zinc helps transport Vitamin A from your liver to the other parts of your body that are in need. In addition, it keeps your testosterone levels high. Zinc also has antioxidant properties. Therefore it helps protect cells in the body from damage caused by free radicals.

A mild zinc deficiency isn't uncommon but taking a zinc supplement, plus eating a healthy diet, should give you all the zinc you need. Low zinc levels are sometimes seen in the elderly, alcoholics, people with anorexia, and people on very restricted diets. Symptoms of zinc deficiency include loss of appetite, poor growth, weight loss, lack of taste or smell, poor wound healing, skin problems (such as acne, atopic dermatitis and psoriasis), hair loss, lack of menstrual periods, night blindness, white spots on the fingernails, and depression. It is very common among the elderly, especially those over 75.

The best sources of zinc are oysters (richest source), red meats, poultry, cheese (ricotta, Swiss, gouda), shrimp, crab, and other shellfish. Other good, though less easily absorbed, sources of zinc include legumes (especially lima beans, black-eyed peas, pinto beans, soybeans, peanuts), whole grains, miso, tofu, brewer's yeast, cooked greens, mushrooms, green beans, pumpkin, and sunflower seeds. Fruits and vegetables are not good sources. Diets low in animal protein, high in fiber and vegetarian diets, in particular, are associated with decreased zinc intake. Our body absorbs 20 - 40% of the zinc present in food.

Survey data indicates that a large number of North Americans have zinc intakes below recommended levels. Athletes, particularly females, are also at risk for zinc deficiency. Decreases in cardiorespiratory function, muscle strength, and endurance have been noted with poor zinc status. Zinc status has been shown to directly affect thyroid hormone levels, BMR, and protein use, which in turn can negatively affect health and physical performance.

More easily absorbed forms of zinc supplements are zinc picolinate, zinc citrate, zinc acetate, zinc glycerate, and zinc monomethionine. The amount of elemental zinc is listed on the product label usually *30 - 50 mg*. To determine the amount to take in supplement form, remember that you get about 10 - 15 mg from food. Individuals should be cautioned against very high single-dose zinc supplements because if taken for several weeks may lead to low HDL cholesterol and nutrient imbalances by interfering with absorption of other nutrients such as iron and copper. Zinc lessens the amount of copper your body absorbs, and high doses of zinc can cause a copper deficiency. For that reason, many doctors recommend that you take *2 mg* of copper along with a zinc supplement.

Copper

Copper is a mineral stored primarily in the liver, with small amounts in all tissues in the body. Although only a small amount is needed, copper is an essential nutrient that plays a role in the production of hemoglobin (the main iron component of red blood cells), myelin (the substance that surrounds nerve fibers), collagen (a key component of bones and connective tissue), and melanin (a dark pigment that colors the hair and skin). Copper also works with vitamin C to help make a component of connective tissue known as elastin.

Copper can act as both an antioxidant and a pro-oxidant. As an antioxidant, it scavenges damaging particles in the body known as free radicals. Antioxidants can neutralize free radicals and may reduce or even help prevent some of the damage they cause. When copper acts as a pro-oxidant at times, it promotes free radical damage and may contribute to the development of Alzheimer's disease and, possibly, cervical dysplasia. Maintaining the proper dietary balance of copper (along with other minerals such as zinc and manganese) is important. Your doctor or dietitian can help you do this.

Signs of possible copper deficiency include anemia, low body temperature, bone fractures and osteoporosis, low white blood cell count (the cells that help fight infection), irregular heartbeat, loss of pigment from the skin, and thyroid disorders. Gastrointestinal disease or surgery is a common cause of copper deficiency. Infants who do not have enough of this mineral tend to have poor feeding habits and lack proper growth. Foods that contain copper include oysters, organ meats (especially liver), whole grain breads and cereals, shellfish, dark green leafy vegetables, dried legumes, nuts, and chocolate.

Selenium

Selenium is an essential mineral found in trace amounts in the body. It works as an antioxidant, especially when combined with vitamin E, by scavenging damaging particles in the body known as free radicals. Free radicals can damage cell membranes and DNA, and may contribute to aging and a number of conditions, including heart disease and cancer. Antioxidants, such as selenium, can neutralize free radicals and may reduce or even help prevent some of the damage they cause.

Selenium plays a role in thyroid function and is needed for the immune system to work properly. People with a number of conditions, ranging from rheumatoid arthritis to some types of cancer, often have low levels of selenium. However, in most cases scientists aren't sure whether low selenium levels are a cause or an effect of the disease.

Selenium is found in some meats and seafood. Animals that eat grains or plants that were grown in selenium-rich soil have higher levels of selenium in their muscle. In the U.S., meats and bread are common sources of dietary selenium. Some nuts are also sources of selenium. Selenium therapeutic supplementation is often recommended at *100-200 mcg*.

Chromium

Chromium is an essential mineral found in very low concentrations in the human body. Chromium is known to enhance the action of insulin. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed for daily life. People with diabetes either do not produce enough insulin or cannot properly use the insulin that their bodies produce. As a result, glucose or sugar builds up in the bloodstream. Chromium was later identified as the active component of GTF. Today, scientists believe chromium to be directly involved in helping insulin bring glucose from the blood into the cells for energy.

As many as 90% of American diets are low in chromium, but few people are deficient in this important mineral. The elderly, people who indulge in strenuous exercise, those who consume excessive amounts of sugary foods, and pregnant women are most likely to be deficient in chromium. Low chromium levels can increase blood sugar, triglycerides (a type of fat in the blood), cholesterol levels, and increase the risk for a number of conditions, such as diabetes and heart disease. Good chromium food sources include whole grain breads and cereals, lean meats, cheeses, and some spices, such as black pepper and thyme. Brewer's yeast is also rich in chromium. Chromium is a widely used supplement. Chromium is sold as a single-ingredient supplement as well as in combination formulas, particularly those marketed for weight loss and performance enhancement. Supplement doses typically range from *50 to 200 mcg*.

Boron

Boron is involved in metabolism of steroid hormones. Boron is used for building strong bones, treating osteoarthritis, as an aid for building muscles and increasing testosterone levels, and for improving thinking skills and muscle coordination. Boron might act like estrogen. If you have any condition that might be made worse by exposure to estrogen, avoid supplemental boron or high amounts of boron from foods. Boric acid, a common form of boron, can kill yeast that cause vaginal infections.

Dietary sources of boron include: dried fruits, nuts, dark green leafy vegetables, applesauce, grape juice, and cooked dried beans and peas. Meat and fish are poor dietary sources of boron. One mg of boron is found in 1.5 ounces of raisins or prunes; 2 ounces of almonds or peanuts; 4 ounces of red wine. Our body's needs for boron probably falls somewhere around 1 mg. A leading boron expert has suggested supplementing *1-3 mg* per day of boron is a reasonable amount to consume. People who eat adequate amounts of produce, nuts, and legumes are likely already eating two to six times this amount. Therefore, whether the average person would benefit by supplementing with this mineral remains unclear.

Essential Fatty Acids (EFAs)

EFAs "essential fatty acids", refers to those omega-6 and omega-3 polyunsaturated fatty acids which are required in the body for biological processes and optimal health and which must be consumed since we cannot synthesize them. Only two EFAs are known for humans: alpha-linolenic acid (omega-3 fatty acid) and linoleic acid (omega-6 fatty acid).

The essential fatty acids start with the **short chain polyunsaturated fatty acids:**

- omega-3 fatty acids:
    - α-Linolenic acid or ALA
- omega-6 fatty acids:
    - Linoleic acid or LA

These two fatty acids cannot be synthesized by humans, as humans lack enzymes required for their production. They form the starting point for the creation of longer fatty acids, which are also referred to as **long-chain polyunsaturated fatty acids**:

- omega-3 fatty acids:
    - eicosapentaenoic acid or EPA
    - docosahexaenoic acid or DHA
- omega-6 fatty acids:
    - gamma-linolenic acid or GLA
    - dihomo-gamma-linolenic acid or DGLA
    - arachidonic acid or AA
- omega-9 fatty acids: are not essential in humans, because humans generally possess all the enzymes required for their synthesis.

In the body, essential fatty acids serve multiple functions. In each of these, the *balance* between dietary ω-3 and ω-6 strongly affects function. Fatty acids are modified to assist with many functions including regulating inflammation and directing cellular signaling. It plays an essential role in the skin where it accumulates in a specific lipid component of the epidermal surface and cells to protect the body from excessive water loss and skin malfunctioning. They help stimulate hair growth, maintain bone health, regulate metabolism, and maintain the reproductive system. Research suggests the benefit of EFA's for healthy infant development. First, let me briefly touch on why this ratio is important. When we eat fat, some of it is incorporated into the cell membrane as phospholipids (lipids with a phosphate attached.) These make up the barrier between the inside and outside of the cells. The phospholipids are important because they're used to make a family of hormone-like molecules called eicosanoids.

Eicosanoids are involved in pretty much everything our body does, and we could spend days just talking about them. The big picture here is that if we're eating a lot of omega 6 fatty acids, we get phospholipids with omega 6 fatty acids in them. The eicosanoids are then made from the omega 6s. The same is true for eating omega 3s.

The eicosanoids made from 3s and 6s have many different functional properties. One of the big differences is that omega 6 eicosanoids are very pro-inflammatory, whereas omega 3 eicosanoids are very weakly inflammatory at best. A dietary shift towards more omega 3s has been shown to help in a variety of diseases from asthma to cardiovascular disease, but it also has the potential to be of benefit to athletes.

Over the past 100 years there has been an enormous imbalanced increase in the consumption of omega-6 fatty acids due to the increased intake of vegetable oils from corn, sunflower seeds, safflower seeds, and soybeans. Today, in Western diets, the ratio of ω 6 to ω 3 fatty acids ranges from 20–30:1 *instead of* the optimal range of 1–2:1. Studies indicate that a high intake of ω-3 fatty acids shifts the physiologic state to one that is antiinflammatory, antithrombotic, antiarrhythmic, hypolipidemic, and vasodilatory properties. These beneficial effects of ω-3 fatty acids have been shown in the prevention and management of cardiovascular disease, coronary heart disease, hypertension and type 2 diabetes. Additional studies also suggest that low levels of essential fatty acids and the wrong balance of types are

a factor in illnesses including osteoporosis, renal disease, rheumatoid arthritis, ulcerative colitis, Crohn's disease, and chronic obstructive pulmonary disease.

There has been a surge in interest of the health effects of omega-3 fatty acids derived from fish/fish oils - consisting of ***DHA -EPA***. DHA is required in high levels in synaptic membranes of the brain and retina as a physiologically-essential nutrient to provide for optimal neuronal functioning (learning ability, mental development) and visual acuity, in young and old alike. This is critical for synaptic transmission and membrane fluidity which is directly related to brain function, improving mood and decreasing depression or suicide behaviors. It is evident that western diets are deficient in ω-3 and excessive in ω-6, and balancing of this ratio would confer numerous health benefits.

Almost all the polyunsaturated fat in the human diet is from EFA. Common food sources of ω-3 and ω-6 fatty acids are fish and shellfish, flaxseed (linseed), hemp oil, soya oil, canola (rapeseed) oil, seeds, pumpkin seeds, sunflower seeds, leafy vegetables, and walnuts. Dietary plant sources of ω-3 contain neither EPA nor DHA. The human body can convert α-linolenic acid to EPA and subsequently DHA. This however requires more metabolic work, which is thought to be the reason that the absorption of essential fatty acids is much greater from animal rather than plant sources. The best source of alpha-linolenic acid, a common omega-3 fatty acid, is flaxseeds or ***flaxseed oil***.

For those seeking to increase their intake of omega-3 fats, *more concentrated sources* can be found in oils such as canola (rapeseed), soybean, walnut, and wheat germ. The NIH Workshop recommended a daily intake of *650 mg of DHA plus EPA* for normal *healthy individuals* (for overall health and cardiovascular care). Finally, the American Heart Association in its official Dietary Guidelines recommended that the daily intake of DHA plus EPA in individuals with coronary heart disease should target *900 mg/day*.

Probiotics

Probiotics are live microorganisms (in most cases, bacteria) that are similar to beneficial microorganisms found in the human gut. They are also called "friendly bacteria" or "good bacteria." The normal human digestive tract contains about 400 types of probiotic bacteria that reduce the growth of harmful bacteria and promote a healthy digestive system. Most often, the bacteria comes from two groups, *Lactobacillus* or *Bifidobacterium*. Within each group, there are different species (for example, *Lactobacillus acidophilus* and *Bifidobacterium bifidus*), and within each species, different strains (or varieties). A few other probiotics, such as *Saccharomyces boulardii*, are yeasts, which are different from bacteria.

Probiotics are not the same thing as **prebiotics** -- nondigestible food ingredients (soluble fiber) that selectively stimulate the growth and/or activity of beneficial microorganisms already in people's colons. When probiotics and prebiotics are mixed together, they form a **synbiotic**.

Two of the most damaging substances to the delicate intestinal flora balance are chlorine and sodium fluoride, present in most treated city water, and thus also present in most beverages which one gets at restaurants. The drinking of alcoholic beverages also contributes to the destruction of the intestinal flora. Poor eating habits, stress, food and medical antibiotics, birth control pills and many other allopathic drugs cause damage to the intestinal flora and to the tissue in the intestinal wall allowing undesirable bacteria to multiply. When the ratio of good bacteria to bad is lowered, problems begin to arise such as excessive gas, bloating, constipation, intestinal toxicity and poor absorption of nutrients.

Probiotics are available in foods and dietary supplements (for example, capsules, tablets, and powders). Examples of foods containing probiotics are yogurt, fermented and unfermented milk, miso, tempeh,

and some juices and soy beverages. In probiotic foods and supplements, the bacteria may have been present originally or added during preparation. A good probiotic supplement will contain *millions to billions of live bacteria* to boost and replenish levels of the health promoting good bugs in your digestive tract. Once there, these probiotic reinforcements join forces with the existing friendly bacteria to help inhibit the growth of more harmful microbes.

Fiber

Dietary fiber plays an essential role in human health. Fiber is a non-digestible carbohydrate and carbohydrate-related substance. Fiber by itself provides no nutrients, but its passage through the digestive tract is greatly beneficial because it helps push along other waste and helps maintain the integrity of the intestinal lining. There are two types of fiber, soluble and insoluble. Most whole plant-based foods contain a combination of the two types. Both types of fiber help maintain the health of your digestive system and adds bulk to your diet, making you feel full faster and reducing appetite.

Soluble (*prebiotic*, viscous) fiber attracts water to form a gel in the digestive tract. This slows digestion, so that your stomach and intestines may trap carbohydrates and slow absorption of glucose which lowers variance in blood sugar levels. Regulated blood sugar may reduce onset risk or symptoms of metabolic syndrome and diabetes. Consuming soluble fiber also improves glucose tolerance in people with diabetes. Fiber lowers total and LDL cholesterol levels over time, which reduces risk of heart disease and stroke. Soluble fiber balances intestinal pH and is fermented by bacteria in the digestive tract to produce short-chain fatty acids. Research has demonstrated taking fiber reduces risk of colorectal cancer. Psyllium husk, certain vegetables such as broccoli, carrots, root vegetables such as sweet potatoes and onions, oats, rye and the soft parts of fruits, dried beans, and legumes are examples of soluble fiber.

I**nsoluble** fiber, on the other hand, can be found in the peels of fruit, such as apples, blueberries, and grapes, vegetables such as green beans, cauliflower, celery, whole grain foods, nuts and seeds. It acts as a natural laxative that speeds the passage of foods through the stomach. It also gives stool its bulk and helps it move quickly through the gastrointestinal tract.

Getting more fiber in your diet has been shown to play a role in the treatment of conditions such as gastrointestinal disease, constipation, hemorrhoids, high cholesterol, heart disease, and diabetes. Most Americans don't get anywhere near the amount of fiber -- 25 to 30 grams per day -- recommended in their daily diet. Most nutritionists recommend high-fiber foods for people trying to lose weight. USDA guidelines suggest *14 grams of fiber for every thousand calories* you consume. If you are trying to lose weight, you may wish to consume more than the minimum requirement.

Product Recommendations

At Goodyear Chiropractic Health Center, we offer only the highest quality nutritional supplements. The brands we offer are formulated with the highest regard for safety and efficacy with the highest quality ingredients and standardized extracts for best absorption and consistent results. Some of the brand names we offer are ***Advocare, Metagenics, Nutrition Dynamics, Optimum Nutrition, Standard Process, and Nutrina***.

Aller-B

Hypoallergenic B Complex

Aller-B contains all 8 B Vitamins in the appropriate ratio distribution; 2000% RDA for the three B-Vitamins (B-1, B-2, and B-6) which have been found to be required in high doses by patients exhibiting symptoms of allergies and food hyper-sensitivities. Also a surgeon who uses megavitamins in his practice found many patients who develop adverse reactions to vitamin supplements are actually reacting to tablet fillers and binders and not the vitamins themselves. Therefore, Aller-B has been put in capsule form without any allergy provoking substances.

One capsule supplies:

- Thiamin (vitamin B1)50 mg
- Riboflavin (vitamin B2)50 mg
- Niacin (as niacinamide)50 mg
- Vitamin B650 mg
- Folate (as folic acid)400 mcg
- Vitamin B1260 mcg
- Biotin50 mcg
- Pantothenic Acid100 mg
- Choline Bitartrate50 mg
- Inositol25 mg
- PABA50 mg

Ultra Potent-C® 1000

1,000 mg of Buffered Vitamin C

Ultra Potent-C 1000 is an exclusive, patented formula that is designed to enhance the utilization of Vitamin C. Preliminary scientific research suggests that vitamin C in the form of Ultra Potent-C may result in improved uptake by white blood cells when compared to regular ascorbic acid. *Provides valuable antioxidant protection. Supports the production of collagen and connective tissue. Supports immune function* by helping to promote natural killer cell and white blood cell activity as compared to simple ascorbic acid.

• Buffered to help prevent potential stomach upset.

One tablet supplies:

- Vitamin C (as Ultra Potent-C©)1,000 mg
- Niacin (as niacinamide ascorbate)77 mg
- Calcium (as calcium ascorbate)47 mg
- Magnesium (as magnesium ascorbate)6 mg
- Sodium (as sodium ascorbate)13 mg
- Potassium (as potassium ascorbate)6 mg
- L-Lysine HCl36 mg

- Citrus Bioflavonoid Complex35 mg
- [standardized to 45% (15.8 mg) full spectrum bioflavonoids]
- Tetrasodium Pyrophosphate15 mg
- Alpha-D-Ribofuranose14 mg
- Xylitol10 mg
- L-Cysteine10 mg
- L-Glutathione5 mg

Multigenics®

Optimum Multiple Vitamin/Mineral Formula

Multigenics is a comprehensive multiple vitamin and mineral formula suitable for adolescents, adults, and seniors that provides an essential, comprehensive foundation for optimal health. Supplies high potency, balanced B vitamins with extra B12 for healthy methylation and homocysteine metabolism. Delivers select nutrients to support liver and adrenal function. Provides broad-spectrum antioxidant protection, which includes quercetin and Caro-xan™, our proprietary blend of beta-carotene and Betatene© mixed carotenoids. Provides natural source vitamin E in a 1:1 ratio of alpha to gamma tocopherols. Features mineral amino acid chelates designed for mineral absorption.

• Also offered in an iron-free formula.

Wellness Essentials™ for Men

Support to Enhance Vitality, Strength, and Stamina

Wellness Essentials™ for Men is a combination of four specialized formulas packaged together to provide essential vitamins and minerals, omega-3 fatty acids, antioxidants, and calcium to support overall health and well-being. Also contains a unique, all-natural herbal formula to support optimal male vitality, stamina, and healthy sexual function.
Packets contain the following four products:

• Tribulus Synergy©: A specialized, concentrated blend of the highest quality Ayurvedic botanical extracts featuring beneficial levels of tribulus fruit extract—a key herb used traditionally to support male libido and healthy sexual function. In combination with cowage seed and ashwagandha extracts, this formula promotes vitality and strength.

• EPA-DHA Extra Strength© Lemon-Flavored: A concentrated, purity-certified source of EPA and DHA—essential omega-3 fatty acids from cold water fish oil that are an important part of foundation nutrition and directly affect cardiovascular health, as well as nervous system and immune system function. Each softgel supplies 500 mg of these critical essential fatty acids, with a light natural lemon flavor to avoid a "fishy" aftertaste.

• Multigenics© Intensive Care without Added Iron: A comprehensive, high quality multivitamin/mineral formula that is easily absorbed. It features a broad spectrum of essential nutrients that include a natural source mixed tocopherols, patented mineral amino acid chelates, ratio-balanced B vitamins, quercetin, and Caro-xan™—a proprietary blend of beta-carotene and Betatene© mixed carotenoids for specialized, balanced antioxidant protection.

• Zinc A.G.™: Features a highly absorbable form of zinc/true amino acid chelate to help maintain prostate and male reproductive health. A mineral with multiple physiological benefits, zinc is also important for energy metabolism and immune support.

Wellness Essentials™ for Women

Optimal Nutritional Support For Women in Convenient Packets

Wellness Essentials for Women is a combination of four specialized nutritional formulas packaged together to provide comprehensive nutritional support and convenience for women in a single dose packet.
Packets contain the following four products:

• *Multigenics© Intensive Care Formula*: A comprehensive, high quality multivitamin/mineral formula that is easily absorbed. It features a broad spectrum of essential nutrients that include a natural source mixed tocopherols, patented mineral amino acid chelates, ratio-balanced B vitamins, quercetin, and Caro-xan™—a proprietary blend of beta-carotene and Betatene© mixed carotenoids for specialized, balanced antioxidant protection.

• *E Complex-1:1™*: As unique combination of four forms of vitamin E—alpha- and gamma-tocopherols in a one-to-one ratio and delta- and beta-tocopherols for optimal vitamin E nutrition and antioxidant activity.

• *EPA-DHA Extra Strength© Enteric-Coated*: A highly concentrated, purity-certified source of EPA and DHA—essential omega-3 fatty acids from cold water fish oil. It is an important part of foundation nutrition and directly affects cardiovascular health and nervous and immune system function.

• *Cal Apatite© with Magnesium*: Supports optimal bone health, and healthy muscle function. This unique, proprietary formula features microcrystalline hydroxyapatite concentrate (MCHC), an excellent source of calcium, delicate protein matrix, organic factors, and bone growth factors that are naturally found in healthy bone. It is blended with three complementary forms of magnesium to achieve a 2:1 calcium-to-magnesium ratio.

Cal Apatite® with Magnesium

Complete Bone NutritionPurity-Certified MCHC with Magnesium

Cal Apatite with Magnesium is the same formula as original Cal Apatite©, but with the addition of 300 mg of magnesium per serving. Magnesium plays important roles in bone metabolism, with over one-half of the total body stores of magnesium found in bone tissue. *Provides a 2:1 calcium to magnesium ratio.*

• Magnesium is provided as a blend of glycinate, citrate, and aspartate designed for enhanced absorption. Does not contain magnesium oxide.

Three tablets supply:

- Vitamin D (as cholecalciferol)600 IU
- Calcium (as MCHC and dicalcium phosphate)600 mg
- Phosphorus (as MCHC and dicalcium phosphate)378 mg
- Magnesium (as magnesium citrate, 300 mg
- magnesium aspartate, and magnesium gylcinate†)
- MCHC††1,500 mg

D3 5000

High Potency, Bioavailable Vitamin D

D3 5000 features 5000 IU of vitamin D3—the most bioavailable form of vitamin D. Supports bone, cardiovascular, immune, and neurological health. Provides high dose vitamin D3 (5000 IU) to quickly replenish vitamin D status

• Solubilized in oil for better absorption in the digestive tract

One softgel supplies:

- Vitamin D3 (as cholecalciferol)5,000 IU

E-Complex 1:1™

Optimal Ratio Alpha and Gamma Tocopherol Blend in a Mixed Tocopherol Complex

E Complex-1:1 is a unique, natural vitamin E supplement that features a 1:1 ratio of alpha- to gamma-tocopherol; this ratio more closely resembles the tocopherol profile found naturally in vitamin E-rich plants, for a *broader range of antioxidant protection against the ravages of free radicals*.

• *Helps maintain cardiovascular health* by promoting healthy circulation, blood vessel integrity, and healthy blood lipids.

• Supports *prostate health, nervous system health, and healthy skin*, and delivers a host of additional health benefits.

Two softgels supplies:

- Vitamin E (d-alpha tocopherol)400 IU†
- Gamma Tocopherol270 mg
- Delta Tocopherol98 mg
- Beta Tocopherol6 mg

EPA-DHA Extra Strength® Lemon Flavored

Concentrated and Stabilized Purity-Certified, Omega-3 Fish Oils

EPA-DHA Extra Strength is a concentrated source of health-promoting, antioxidant stabilized, omega-3 essential fatty acids from cold water fish. Advantages of this premium formula include: Pharmaceutical-grade fish oil. Low in cholesterol.

• *EPA-DHA Extra Strength supports healthy musculoskeletal, cardiovascular, nervous, and immune functions*.

Two soft gels supply:

- Calories20
- Calories from Fat18
- Total Fat1 g
- Cholesterol< 5 mg
- Natural Marine Lipid Concentrate2 g
- EPA (Eicosapentaenoic acid) 600 mg
- DHA (Docosahexaenoic acid) 400 mg

Other Ingredients:

- Gelatin, purified water, glycerin, natural lemon flavor, mixed tocopherols, rosemary, and ascorbyl palmitate. Contains: fish (herring, sardine, anchovy).

Zinc A.G.™

Highly Absorbable Zinc/True Amino Acid Chelate

Zinc A.G. features a 100% nutrient-dense formula in that each of the active ingredients—zinc, arginine, and glycine—play important and well-established physiologic roles. *Promotes healthy immune and prostate function. Supports the enzymatic activity associated with energy metabolism, bone mineralization, and tissue synthesis*.

• Features a proprietary, patented chelate that utilizes the amino acids glycine and arginine for enhanced zinc absorption.

One tablet supplies:

- Zinc (as zinc arginate†, glycinate†)20 mg

Herbulk®

Blend of Soluble and Insoluble Fibers in a 1:1 Ratio

Herbulk is a blend of Soluble and Insoluble Fibers in a 1:1 Ratio designed primarily to provide the metabolic benefits of fiber, while also supporting intestinal function and integrity. Herbulk can be used alone or as a vital part of any medical food program. *Supports intestinal short chain fatty acid production and the regeneration of intestinal epithelial cells*. Supplies satiety-enhancing fiber to create a feeling of fullness.

• Great for those who have occasional loose stools.

Serving Size: One scoop (20 g) Servings per Container: 17.5 One serving supplies:

- Calories45
- Calories from Fat9
- Total Fat1 g
- Cholesterol0 mg
- Total Carbohydrates14 g
- Dietary Fiber6 g
- Soluble Fiber3 g
- Insoluble fiber3 g
- Protein1 g
- Vitamin C60 mg
- Sodium10 mg

MetaFiber®

Low-Allergy-Potential Fiber Mix

MetaFiber is a low-allergy-potential fiber drink mix designed to support healthy intestinal transit time and bowel regularity. One serving provides approximately 83% insoluble and 17% soluble dietary fiber. Excellent support for those with occasional constipation. Supports the structural integrity of the intestinal wall.

• Provides the benefits of dietary fiber without the more allergenic or hypersensitizing fibers, making it great for those who are sensitive to psyllium, corn, or citrus products.

Serving Size: Two scoops (10 g) Servings per Container: 38 Nutritional Information per Serving:

- Calories15
- Calories from Fat9
- Total Fat1 g
- Saturated Fat0 g
- Cholesterol0 mg
- Sodium5 mg
- Total Carbohydrate7 g
- Dietary Fiber6 g
- Soluble Fiber1 g
- Insoluble fiber5 g
- Protein1 g
- Vitamin E5 IU

Advocare Fiber Drink

Delicious Fiber Mix with 10 grams of fiber

Advocare Fiber Drink provides 10 grams of dietary fiber, helping you reach your goal of 25 grams each day. Furthermore, each serving provides six grams of soluble fiber and four grams of insoluble fiber.

Soluble fiber absorbs water in your stomach and intestines. This provides a feeling of fullness that helps curb your appetite. Soluble fiber can also help minimize the absorption of fats and sugars.

Insoluble fiber does not absorb water, but rather moves quickly through your system, cleansing the digestive tract and eliminating waste as it goes. Once your digestive tract is cleansed by the insoluble fibers in Fiber Drink, your body will be able to better absorb vitamins, minerals and nutrients, leading to better health.

Serving Size: 1 pouch (10 g) Servings per pouch:

- Calories70
- Sodium10 mg
- Total Carbohydrate17 g
- Dietary Fiber10 g
- Soluble Fiber6 g
- Insoluble fiber4 g
- Vitamin C 30mg
- Vitamin A 1,000IU

Acidophilus H.P.

Enteric Coated, Hypoallergenic 2.8 Billion Live Organisms per Capsule

As much as 98% of the fragile, living organisms in many acidophilus powders, liquids and capsules are destroyed by harsh stomach acids before they reach the lower intestinal tract. *Acidophilus H.P. is acid resistant and heat tolerant to allow delivery of maximum potency of live organisms to the lower intestinal tract* where it is needed to restore and/or maintain a balance of healthful organisms and inhibit the growth of pathogenic organisms. MUST BE REFRIGERATED.

Each vegetable capsule supplies:

- Lactobacillus acidophilus, casei, rhamnosus280 mg

Ultra Flora IB™

Relief for Abdominal Discomfort

Ultra Flora IB is an enhanced potency probiotic formula designed to help relieve bowel irritation and related functional discomforts by promoting a healthy balance of intestinal microflora. Specific, strain-identified beneficial microflora—such as the probiotics *50:50 blend of Lactobacillus acidophilus NCFM®*

and Bifidobacterium lactis found in UltraFlora IB—have been demonstrated clinically effective in relieving these symptoms and improving reported quality of life. Helps support healthy intestinal motility. May help address abdominal discomfort, bloating, and cramping.

• Delivers a convenient, powerful dosage of over 60 billion colony forming units (CFUs) per capsule.
• Offers relief with only one to two capsules daily.

One capsule† supplies:

- A 50:50 blend of:60 billion live organisms††
- Lactobacillus acidophilus NCFM® Strain
- Bifidobacterium lactis Bi-07 Strain

LactoViden™

Support for a Healthy Mucosal Barrier

LactoViden ID is a non-dairy probiotic supplement featuring 15 billion highly viable organisms including the extensively researched NCFM© Lactobacillus acidophilus and a symbiotic, strain-identified blend of lactobacilli and Streptococcus thermophilus. Encourages the growth of beneficial microflora, particularly in the small intestine. Supports a broad range of digestive and immune system functions.

• Guaranteed to provide no less than 15 billion combined live organisms per serving through date of expirations.

One capsule† supplies:

- A proprietary blend of:15 billion live organisms††
- Lactobacillus acidophilus NCFM© Strain
- Lactobacillus salivarius Ls-33
- Lactobacillus paracasei Lpc-37
- Lactobacillus plantarum Lp-115
- Streptococcus thermophilus St-21

Dynamic Greens with Mangosteen–(Metagenics)

Easy-to-mix, as well as great tasting "phytonutrient" powder drink that is loaded with certified organic whole foods from both fruits and vegetables and concentrated plant extracts. Provides a "super-blend" of 100% natural mangosteen extract, vitamins, flax lignans, ionic trace minerals, enzymes, antioxidants, phytonutrients, and symbiotic intestinal flora. This dynamic blend supplies your body with boosted energy, metabolism, fat-burning, digestion, detoxification, immunity, repair, recovery, revitalization and longevity.

Be sure to discuss nutritional supplementation with your health care provider, especially if you have a health condition or are currently taking medication.

Maintain a healthy Lifestyle

Make sure that you're eating a sensible diet, training regularly and intensely, staying well hydrated, and getting at least seven hours of sleep every night. Protein provides the building blocks, but even the best sources won't build new muscle without the proper stimulus and **consistency**!

For more on why nutritional supplements are an important part of healthy eating, schedule your nutrition consult.