Riboflavin (vitamin B2) is manufactured in the body by the intestinal flora and is easily absorbed, although very small quantities are stored, so there is a constant need for this vitamin.

**Vitamin B2 - riboflavin - is required for**

It is required by the body to use oxygen and the metabolism of amino acids, fatty acids, and carbohydrates. Riboflavin is further needed to activate vitamin B6 (pyridoxine), helps to create niacin and assists the adrenal gland. It may be used for red blood cell formation, antibody production, cell respiration, and growth.

It eases watery eye fatigue and may be helpful in the prevention and treatment of cataracts. Vitamin B2 is required for the health of the mucus membranes in the digestive tract and helps with the absorption of iron and vitamin B6.

Although it is needed for periods of rapid growth, it is also needed when protein intake is high, and is most beneficial to the skin, hair and nails.

**Deficiency of vitamin B2**

A shortage of this vitamin may manifest itself as cracks and sores at the corners of the mouth, eye disorders, inflammation of the mouth and tongue, and skin lesions.

Dermatitis, dizziness, hair loss, insomnia, light sensitivity, poor digestion, retarded growth, and slow mental responses have also been reported. Burning feet can also be indicative of a shortage.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Male 1.6 mg per day and female 1.2 mg per day although 50 mg is mostly recommended for supplementation.

**Toxicity and symptoms of high intake**

The limited capacity to absorb orally administered riboflavin precludes its potential for harm. Riboflavin intake of many times the RDA is without demonstrable toxicity.

A normal yellow discoloration of the urine is seen with an increased intake of this vitamin - but it is normal and harmless.

**Food sources of vitamin B2**

Organ meats, nuts, cheese, eggs, milk and lean meat are great sources of riboflavin, but is also available in good quantities in green leafy vegetables, fish, legumes, whole grains, and yogurt.
Vitamin B1 - thiamine, thiamin - information page

Thiamin, also called vitamin B1, is used in many different body functions and deficiencies may have far reaching effects on the body, yet very little of this vitamin is stored in the body, and depletion of this vitamin can happen within 14 days.

Thiamin is also a miraculous nutrient, somebody suffering from beriberi, scarcely able to lift their head from their pillow, will respond quickly from injected thiamin, and will be on their feet within a matter of hours.

**Vitamin B1 - thiamine - is required for**

Thiamin may enhance circulation, helps with blood formation and the metabolism of carbohydrates. It is also required for the health of the nervous system and is used in the biosynthesis of a number of cell constituents, including the neurotransmitter acetylcholine and gamma-aminobutyric acid (GABA). It is used in the manufacture of hydrochloric acid, and therefore plays a part in digestion.

It is also great for the brain and may help with depression and assist with memory and learning. In children it is required for growth and has shown some indication to assist in arthritis, cataracts as well as infertility.

**Deficiency of vitamin B1**

A deficiency will result in beriberi, and minor deficiencies may be indicated with extreme fatigue, irritability, constipation, edema and an enlarged liver. Forgetfulness, gastrointestinal disturbances, heart changes, irritability, labored breathing and loss of appetite may also be experienced.

With too little thiamin around a person may also experience nervousness, numbness of the hands and feet, pain and sensitivity, poor coordination, tingling sensations, weak and sore muscles, general weakness and severe weight loss.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Male 1.4 mg per day and female 1.0 mg per day, although 50 mg is usually used in supplementation.

**Toxicity and symptoms of high intake**

Thiamin toxicity is uncommon;

**Food sources of vitamin B1**

Sunflower seeds, peanuts, wheat bran, beef liver, pork, seafood, egg-yolk, beans all contain good amounts of thiamin.
Vitamin B6, also known as pyridoxine is part of the B group vitamins and is water-soluble and is required for both mental and physical health.

**Vitamin B6 - pyridoxine - is required for**

Pyridoxine is required for the balancing of hormonal changes in women as well as assisting the immune system and the growth of new cells. It is also used in the processing and metabolism of proteins, fats and carbohydrates, while assisting with controlling your mood as well as your behavior. Pyridoxine might also be of benefit for children with learning difficulties, as well as assisting in the prevention of dandruff, eczema and psoriasis.

It assists in the balancing of sodium and potassium as well promotes red blood cell production. It is further involved in the nucleic acids RNA as well as DNA. It is further linked to cancer immunity and fights the formation of the toxic chemical homocysteine, which is detrimental to the heart muscle.

Women in particular may suffer from pre-menstrual fluid retention, severe period pains, emotional PMS symptoms, premenstrual acne and nausea in early pregnancy. Mood swings, depression as well as loss of sexual drive is sometimes noted when pyridoxine is in short supply and the person is on hormone replacement therapy or on birth control pills.

**Deficiency of vitamin B6**

Irritability, nervousness and insomnia as well as general weakness, skin changes such as dermatitis and acne as well asthma and allergies might develop when pyridoxine is in short supply. Symptoms may include nails that are ridged, an inflamed tongue as well as changes to your bones - which can include osteoporosis and arthritis. Kidney stones may also appear.

Vitamin B6 deficiency symptoms will be very much like those of B2 and B3. Vitamin B6 is needed by the body to manufacture its own B3 vitamin.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Males 2 mg per day and females 2 mg per day.

**Food sources of vitamin B6**

Good sources to obtain pyridoxine from are brewer’s yeast, eggs, chicken, carrots, fish, liver, kidneys, peas, wheat germ, walnuts,
Potassium dietary mineral information page

Potassium is one of the electrolytes we all require to maintain health.

Potassium is required for

It is needed for growth, building muscles, transmission of nerve impulses, heart activity etc.

Potassium, together with sodium - potassium inside the cell and sodium in the fluid surrounding the cell, work together for the nervous system to transmit messages as well as regulating the contraction of muscles.

Deficiency of potassium

The kidneys excrete any excesses, but deficiencies are seldom found in people on normal diets, although most people could look at increasing their potassium intake. A deficiency may result in fatigue, cramping legs, muscle weakness, slow reflexes, acne, dry skin, mood changes, irregular heartbeat.

If you are into bodybuilding, it is also a good idea to increase your potassium intake, since potassium is needed to maintain your muscles in good form, controlling your muscle actions, and since potassium is lost in excessive sweating and urine. A great way to include this in your diet is to have a banana, citrus fruit or even a dash of apple cider vinegar.

Dosage

The dosage underneath is the Recommended Daily Allowance (RDA), but 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.

A daily intake of about 3,500 milligrams is needed. Potassium is well absorbed, but is not stored in large quantities in the body.

Toxicity and symptoms of high intake

Excessive potassium can be toxic and will affect your heart, but is mainly a problem when you suffer from a problem such as kidney failure.

Food sources

Potassium is found in fruit, vegetables as well as whole grains, citrus fruit, molasses, fish and unprocessed meats.
Sodium dietary mineral information page

Sodium is required by the body, but most people have a far too high intake of sodium (salt) in their diet.

**Sodium is required for**

Sodium is an electrolyte in the body and is required in the manufacture of hydrochloric acid in the stomach, which protects the body from any infections that may be present in food.

**Deficiency of sodium**

A deficiency is rare, but can easily happen with diarrhea, vomiting or excessive sweating, and a shortage may lead to nausea, dizziness, poor concentration and muscle weakness.

**Toxicity and symptoms of high intake**

Excessive sodium may cause high blood pressure, which may lead to a host of health problems. Excessive long-term use of sodium may also cause a loss of calcium from your body.

**Dosage**

The dosage underneath is the Recommended Daily Allowance (RDA), but 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.

An amount of about 2,400 milligrams is needed daily.

**Sodium food sources**

Sodium is found in table salt, anchovies, bacon etc.
Vitamin K -phylloquinone - information page

Vitamin K (phylloquinone) can be produced in the intestines and this function is improved with the presence of cultured milk, like yogurt, in the diet. Vitamin K is classified as a fat-soluble vitamin.

Vitamin K is found in nature in two forms - K1, also called phylloquinone, is found in plants and vitamin K2, also called menaquinone, which can be synthesized by many bacteria. Vitamin K3, menadione, is a synthetic form of this vitamin which is manmade.

Vitamin K is required for

Vitamin K is used in the body to control blood clotting and is essential for synthesizing the liver protein that controls the clotting. It is involved in creating the important prothrombin, which is the precursor to thrombin - a very important factor in blood clotting. It is also involved in bone formation and repair. In the intestines it also assists in converting glucose to glycogen, this can then be stored in the liver. There are some indications that Vitamin K may decrease the incidence or severity of osteoporosis and slow bone loss.

Deficiency of vitamin K

A deficiency of this vitamin in newborn babies results in hemorrhagic disease, as well as postoperative bleeding and hematuria while muscle hematomas and inter-cranial hemorrhages have been reported.

A shortage of this vitamin may manifest itself in nosebleeds, internal hemorrhaging.

Toxicity and symptoms of high intake

Toxicity does not easily occur with normal dietary intake of this vitamin, but can happen if synthetic compound vitamin K 3 is taken. High to toxic uptake in the synthetic form can cause flushing and sweating. Jaundice and anemia may also develop.

Dosage

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Males 80 micrograms per day and females 70 micrograms per day..

Food sources of vitamin K

Vitamin K is found in leafy vegetables (especially spinach and celery), cheese and liver. It is also found in asparagus, coffee, bacon and green tea.
Calcium dietary mineral information page

Calcium is needed for so many different functions in the body, from bones, to blood clotting, your muscles etc. People often think of bones as a static piece of the body, where very little change occurs, but that is a totally incorrect perception. Bone is a dynamic part of the body and calcium is constantly flowing into, and out of it.

Calcium is required for

Calcium is needed for the formation and maintenance of bones, the development of teeth and healthy gums. It is necessary for blood clotting, stabilizes many body functions and is thought to assist in preventing bowel cancer.

It has a natural calming and tranquilizing effect and is necessary for maintaining a regular heartbeat and the transmission of nerve impulses. It helps with lowering cholesterol, muscular growth, the prevention of muscle cramps and normal blood clotting.

Furthermore it also helps with protein structuring in DNA and RNA. It provides energy, breaks down fats, maintains proper cell membrane permeability, aids in neuromuscular activity and helps to keep the skin healthy. Calcium also stops lead from being absorbed into bone.

Deficiency of calcium

Prolonged bone re-absorption from chronic dietary deficiency results in osteoporosis - from either too little bone mass accumulation during growth or higher rate of bone loss at menopause. Dietary calcium deficiency also has been associated with increased risk of hypertension, and colon cancer.

When it is in short supply, a variety of symptoms from aching joints, eczema, elevated blood cholesterol, heart palpitations, brittle nails, hypertension (high blood pressure) and insomnia can become evident.

Muscle cramps, nervousness, numbness in the arms and legs, rheumatoid arthritis, convulsions, depression and delusions have also been noted.

Dosage

The dosage underneath is the Recommended Daily Allowance (RDA), but 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.

1,000 mg per day for people aged 19-50 years 1,200 mg per day for people over the age of 51 years.

The maximum level of calcium is 2.5 g/day. It is also recommended one to two parts of calcium and phosphorus to one part of magnesium.
Toxicity and symptoms of high intake

Excess calcium supplementation has been associated with some mineral imbalances such as zinc, but combined with a magnesium deficiency it may cause deposits to form in your kidneys.

Food sources of calcium

Milk, milk products, beans, nuts, molasses and fruit contain good amounts of calcium. Fish and seafood, as well as green leafy vegetables supply good amounts of calcium.
Iron dietary trace element information page

Iron is an essential element carrying oxygen, forming part of the oxygen-carrying proteins - hemoglobin in red blood cells and myoglobin in muscles. It is also a component of various enzymes and is concentrated in bone marrow, liver, and spleen.

Iron is required for

The production of hemoglobin and myoglobin (the form of hemoglobin found in muscle tissue) requires this nutrient.

It is also needed for the oxygenation of red blood cells, a healthy immune system and for energy production.

Deficiency of iron

Severe iron deficiency results in anemia, and red blood cells that have a low hemoglobin concentration. Anemia in pregnancy increases the risk of having a premature baby or a baby with low birth weight.

In young children, iron deficiency can manifest in behavioral abnormalities (including reduced attention), reduced cognitive performance and slow growth. In adults, severe iron deficiency anemia impairs physical work capacity.

Symptoms of iron deficiency may include fatigue, poor stamina, intestinal bleeding, excessive menstrual bleeding, nervousness, heart palpitations and shortness of breath. It may also cause your mouth corners to crack, brittle hair, difficulty in swallowing, digestive disturbances and spoon shaped nails with ridges running lengthwise.

Dosage

The dosage is the Recommended Daily Allowance (RDA), but 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.

In the case of microelements, such as trace elements, the amounts are very small, yet they are still important.

The indicated dosage for males is 10 mg per day, and 18 mg per day for females.

Toxicity and symptoms of high intake

High iron content in the body has been linked to cancer and heart disease.

People of European origin, sometimes have a genetic abnormality for storing excessive iron (1:300) where ten percent of these populations carry a gene for hemochromatosis. Iron supplements are the leading cause of death in children - so keep the supplements out of the reach of children.
A fatal dose for children could be as little as 600 milligrams. Iron can be poisonous and if too much is taken over a long period could result in liver and heart damage, diabetes and skin changes.

Large iron supplementation may also contribute to the hardening of arteries, heart disease and reducing zinc absorption.

**Food sources of iron**

Heme iron (present in red blood cells and muscles) found in meat, poultry and fish - is readily absorbed; Non-heme iron - with the absorption more influenced by other dietary factors, are present in cereals, fruits, grains, beans and vegetables.
Zinc trace element information page

Zinc is one of the minerals men should never be without (see lower down on page) and has such a wide application in human health that everybody should ensure that they obtain enough of this humble trace element.

Zinc is required for

It is necessary for a healthy immune system, and is also of use in fighting skin problems such as acne, boils and sore throats. It is further needed for cell division, and is needed by the tissue of the hair, nails and skin to be in top form. Zinc is further used in the growth and maintenance of muscles.

Children, for normal growth and sexual development also require zinc.

It also seems as if zinc helps to control the oil glands, and is also required for the synthesis of protein and collagen - which is great for wound healing and a healthy skin.

Deficiency of zinc

There is a shortage of zinc in many people's diet, since zinc is destroyed in the milling process and is also lost in cooking. A deficiency will result in an under-performing immune system, open to infections, allergies, night blindness, loss of smell, falling hair, white spots under finger nails, skin problems, sleep disturbances etc.

Men with zinc shortage may have a problem with fertility, while women may experience irregular periods. Children with too little zinc may have stunted growth and slow sexual maturity.

With too little in the body, the sense of smell might suffer, as well as your sense of taste.

Dosage

The dosage is the Recommended Daily Allowance (RDA), but 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.

In the case of microelements, such as trace elements, the amounts are very small, yet they are still important.

Toxicity and symptoms of high intake

Elevated intake of zinc (1-2 gram per day) over an extended period can actually harm your immune system instead of assisting it. Intake of zinc should be kept to under 100 mg per day as larger amounts may result in nausea, diarrhea, dizziness, drowsiness and hallucinations.

It is best to take a zinc supplement separately from other minerals, especially iron, copper, manganese and calcium as they may interfere with zinc absorption. Some people take it at night, but some individuals may react by having an upset stomach if taken on an empty stomach. In a multi-vitamin situation, make sure that the zinc and iron is nearly in the same amounts.
Large intakes of zinc can cause nausea and diarrhea, vomiting, dehydration, fever and chills, electrolyte imbalances, dizziness, abdominal pain, lethargy and a disruption of coordination.

**Food sources of zinc**

Great sources are found in muscle meat, poultry, fish and seafood, while grains, nuts, eggs, seeds and brewer’s yeast also supply good quality zinc.
Vitamin A (retinol and beta-carotene) information page

Vitamin A and carotene can be obtained from either animal or vegetable sources. The animal form is divided between retinol and dehydroretinol whereas the vegetable carotene can be split into four very potent groups - alpha-carotene, beta-carotene, gamma-carotene and crypto-carotene. With enough beta-carotene available in the body, the body can manufacture its own vitamin A.

**Vitamin A is required for**

Vitamin A is required for night vision, and for a healthy skin. It assists the immune system, and because of its antioxidant properties is great to protect against pollution and cancer formation and other diseases. It also assists your sense of taste as well as helping the digestive and urinary tract and many believe that it helps slow aging.

It is required for development and maintenance of the epithelial cells, in the mucus membranes, and your skin, and is important in the formation of bone and teeth, storage of fat and the synthesis of protein and glycogen.

**Deficiency of vitamin A**

A deficiency of vitamin A may lead to eye problems with dryness of the conjunctiva and cornea, dry skin and hair, night blindness as well as poor growth.

Dry itchy eyes that tire easily are normally a warning of too little vitamin A. If the deficiency become severe, the cornea can ulcerate and permanent blindness can follow.

Abscesses forming in the ear, sinusitis, frequent cold and respiratory infections as well as skin disorders, such as acne, boils and a bumpy skin, as well as weight loss might be indicative of the vitamin being in short supply.

Insomnia, fatigue and reproductive difficulties may also be indicative of the vitamin in short supply. Your hair and scalp can also become dry with a deficiency, especially if protein is also lacking.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Male 5,000 IU per day (1,000 µg equivalent), female 4,000 IU per day (800 µg retinol equivalent), although 10,000 IU per day is normally used in supplementation.

**Toxicity and symptoms of high intake**

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.

Pregnant women must be careful as a high intake of this vitamin can cause birth defects.

Pro-vitamin A - beta-carotene does not cause toxicity.

Be careful if you in the unlikely event run across polar bear on a menu - 500 gram (about ½ a
pound) of polar bear liver will deliver about 9,000,000 IU to your diet - a very lethal dose. Headaches, blurred vision, loss of hair, drowsiness and diarrhea, enlargement of the spleen and liver can all be indications when your intake is too high.

Other interesting points

There seems to be no toxicity when ingesting large amounts of beta-carotene - you might however have a slightly orange colored skin, as the carotene gets stored in your skin.

Food sources of vitamin A

Liver, milk, egg-yolk, carrots, dark green leafy vegetables and yellow fruits are high in vitamin A or beta-carotene.
Vitamin B12 - cyanocobamin and cobolamin - information page

Vitamin B12, known as cyanocobalamin, cobolamin and also known as the energy vitamin is a very widely researched vitamin, and used in supplementation to a very large degree.

This complex structured compound with its cobalt content forms part of the B group vitamins, and the body needs very small amounts.

**Vitamin B12 - cyanocobamin - is required for**

Cobolamin is needed in the manufacture of red blood cells and the maintenance of red blood cells and it stimulates appetite, promotes growth and release energy. It is often used with older people to give an energy boost, assist in preventing mental deterioration and helps with speeding up thought processes. Some people are also of the opinion that it helps with clearing up infections and provide protection against allergies and cancer. This vitamin is also used in the metabolism of fats, proteins and carbohydrates.

**Deficiency of vitamin B12**

Some symptoms of a deficiency will include a sore tongue, weakness, fatigue, and weight loss, back pain and apathy. It might further result in loss of balance, decreased reflexes, tingling of the fingers, ringing in the ears etc.

A deficiency may also result in the raising of the level of homocysteine in the blood - which in high doses can be toxic to the brain, which may be involved in Alzheimer disease. Severe deficiency may result in pernicious anemia also called Addisonian pernicious anemia.

Another problem that appears in deficiency is the eroding of the myelin sheath - the fatty sheath of tissue, which insulates the nerve fibers in your body.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Male and female 3 mcg per day.

**Toxicity and symptoms of high intake**

Toxicity not established but people taking vitamin B12 injections may experience skin problems if in large excess, but will normalize once the injections are stopped.

**Other interesting points**

Vitamin B12 can not be manufactured by any plants, and therefore is only found in animal products - therefore a deficiency may happens to people on a strict vegan diet.

Unlike other water-soluble vitamins, B12 needs some 3 hours to be absorbed where other B vitamins are absorbed nearly immediately.
Food sources of vitamin B12

Vitamin B12 is present in liver, organ meat, muscle meat, shellfish, eggs, cheese, fish, and can be manufactured in the body. Although milk contains B12, processing of milk may lead to destruction of the vitamin.
Vitamin C - ascorbic acid - information

Vitamin C also known as, ascorbic acid, L-ascorbic acid, dehydroascorbic acid, the antiscorbutic vitamin, L-xylascorbic acid and L-threo-hex-2-uronic acidy-lactone, is a much talked about vitamin, with people claiming it as a cure-all for may diseases and problems - from cancer to the common cold.

Yet, this miracle vitamin cannot be manufactured by the body, and needs to be ingested.

**Vitamin C is required for**

Vitamin C is required in the synthesis of collagen in connective tissue, neurotransmitters, steroid hormones, carnitine, conversion of cholesterol to bile acids and enhances iron bioavailability. Ascorbic acid is a great antioxidant and helps protect the body against pollutants.

Because vitamin C is a biological reducing agent, it is also linked to prevention of degenerative diseases - such as cataracts, certain cancers and cardiovascular diseases.

Ascorbic acid also promotes healthy cell development, proper calcium absorption, normal tissue growth and repair - such as healing of wounds and burns. It assists in the prevention of blood clotting and bruising, and strengthening the walls of the capillaries.

Vitamin C is needed for healthy gums, to help protect against infection, and assisting with clearing up infections and is thought to enhance the immune system and help reduce cholesterol levels, high blood pressure and preventing arteriosclerosis.

**Deficiency of vitamin C**

When there is a shortage of Vitamin C, various problems can arise, although scurvy is the only disease clinically treated with vitamin C. However, a shortage of vitamin C may result in "pinpoint" hemorrhages under the skin and a tendency to bruise easily, poor wound healing, soft and spongy bleeding gums and loose teeth.

Edema (water retention) also happens with a shortage of vitamin C, and weakness, a lack of energy, poor digestion, painful joints and bronchial infection and colds are also indicative of an under-supply.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

The RDA is 60 mg, per day - yet this amount will only prevent you from picking up scurvy and more recent studies suggest that an intake between 200 - 500 mg per day may be the most beneficial for healthy people.

The recommend dosage for pregnant or lactating women is 75-95 mg per day.
Toxicity and symptoms of high intake

Since ascorbic acid is a water-soluble vitamin, toxic levels are not built up or stored in the body, and any excess is lost mostly through urine. If extremely large amounts are taken gastrointestinal problems may appear, but will normalize when the intake is cut or reduced. To determine a level where a person might experience discomfort is difficult, since some people can easily stomach up to 25,000 mg per day, while others start having a problem at 600 or 1,000 mg.

Some people using mega dose therapy of vitamin C may have side effects such as gastrointestinal complaints including diarrhea, nausea and abdominal cramps. These side effects normally stop as soon as high potency intake is reduced or stopped.

Other interesting points

Ongoing research is looking at the clinical use of vitamin C in the prevention and treatment of human diseases.

Food sources of vitamin C

Good sources of vitamin C are green leafy vegetables, berries, citrus fruits, guavas, tomatoes, melons, papayas etc.
Vitamin D is also referred to as calciferol and can rightly be called the sunshine vitamin, since the body, in a sunny climate can manufacture this nutrient from sunshine on your skin using cholesterol from your body to do so.

Please remember that this can be achieved in about 30 minutes by fair skinned people, while dark skinned people, because of the pigmentation need about 3 hours to reach the same level of manufacture. The sunlight needed for this process is pure unfiltered sunlight.

**Vitamin D is required for**

Vitamin D helps with increasing the absorption of calcium, assists in bone growth and the integrity of bone and promotes strong teeth.

It also helps regulate the amount of phosphorus in the body as well as assisting in a healthy heart and nervous system. In some recent studies it has also shown great promise in assisting psoriasis, the immune system, thyroid function as well as normal blood clotting.

**Deficiency of vitamin D**

A shortage can lead to softening of the bone and muscle twitching and convulsions, and in children it causes rickets - resulting in bent legs. In adults, the shortage causes loss of minerals from the bones, (osteomalacia) where the bones are sore, tender, and weak muscles with the possibility of deafness developing. In older people, osteoporosis may appear when protein is also lost from the bone. Vitamin D in short supply is also linked to having a burning sensation in the mouth and throat, diarrhea, insomnia and visual problems.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Male 400 iu, female 400 iu.

**Toxicity and symptoms of high intake**

Some clinical guidelines for toxicity are sometimes set as 5,000 to 10,000 IU per day to cause toxicity, but other researchers place the value much higher to reach toxicity. You are however advised to keep your supplement intake to no more than 600 IU per day. Having too much vitamin D in your system could leave a too elevated calcium level, a lower appetite, increased thirst, nausea, vomiting, drowsiness, abdominal pain. A long-term effect of too much vitamin D is the deposit of calcium in soft tissues of the body including the blood vessel walls and kidneys where it can cause serious damage.

**Food sources of vitamin D**

Vitamin D is present in fatty fish like kipper, sardines, salmon, tuna and mackerel, liver, egg yolk and butter. Smaller amounts are also present in dark leafy vegetables.
**Vitamin B9 - folic acid, folacin, folate - information page**

Folic acid, also known as Vitamin B9, is also referred to as folacin or folate and its chemical name is pteroylglutamic acid. This vitamin can be manufactured by the body and be stored in the liver.

**Vitamin B9 - folic acid - is required for**

Folic acid is required for DNA synthesis and cell growth and is important for red blood cell formation, energy production as well as the forming of amino acids. Folic acid is essential for creating heme, the iron containing substance in hemoglobin, crucial for oxygen transport.

It is important for healthy cell division and replication, since its involvement as coenzyme for RNA and DNA synthesis. It is also required for protein metabolism and in treating folic acid anemia. Folic acid also assists in digestion, and the nervous system, and works at improving mental as well as emotional health. This nutrient may be effective in treating depression and anxiety.

Shortage of folic acid may be indicated with diarrhea, heartburn and constipation.

Folic acid is very important in the development of the nervous system of a developing fetus.

**Deficiency of vitamin B9**

A deficiency of folic acid on an unborn baby may increase the risk of the baby being born with spina bifida and other serious defects of the nervous system.

When deficient of folic acid, you might suffer from fatigue, acne, a sore tongue, cracking at the corners of your mouth (same as deficiency of vitamin B2, vitamin B6 as well as iron). Long term deficiency may result in anemia and later in osteoporosis, as well as cancer of the bowel and cervix.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

400 micrograms per day.

**Toxicity and symptoms of high intake**

Anybody on medication for epilepsy should be careful with large amounts of folic acid, since it can change the functioning of such drugs.

Too much folic acid may mask a Vitamin B12 deficiency. Regular high intake of folic acid may cause digestive upset, energy loss and insomnia.
Other interesting points

Localized deficiencies of folic acid may exist for smokers, as low levels have been detected in the lungs of smokers.

Food sources of vitamin B9

Fresh green vegetables, such as spinach and broccoli contain folic acid. It is also found in fruit, starchy vegetables, beans, whole grains and liver.
Vitamin E has earned itself a reputation - from spicing up your sex life to banning wrinkles and old age. One of the most important functions of this vitamin is its antioxidant properties. Vitamin E is an essential fat-soluble vitamin that includes eight naturally occurring compounds in two classes designated as tocopherols and tocotrienols.

Vitamin E is an effective chain-breaking, lipid-soluble antioxidant in biological membranes, and aids in membrane stability.

**Vitamin E is required for**

Vitamin E is a powerful antioxidant, protects your cells from oxidation, and neutralizes unstable free radicals, which can cause damage. This is done by the vitamin E giving up one of its electrons to the electron deficient free radical, making it more stable. While Vitamin E performs its antioxidant functions, it also protects the other antioxidants from being oxidized.

This antioxidant capability is then also great in helping to prevent degenerative diseases - including heart disease, strokes, arthritis, senility, diabetes and cancer. It also assists in fighting heart disease and cancers and is essential for red blood cells, helps with cellular respiration and protects the body from pollution - especially the lungs. Vitamin E is also useful in preventing blood clots from forming and promotes fertility, reduces and/or prevents hot flushes in menopause. An increase in stamina and endurance is also attributed to Vitamin E.

Vitamin E is also used topically to great effect for skin treatments - in helping the skin look younger, promoting healing and cutting down the risk of scar tissue forming. Used on the skin it is also reported to help with eczema, skin ulcers cold sores and shingles.

**Deficiency of vitamin E**

Deficiency of Vitamin E is not common, and the symptoms not very clear cut, but may include fatigue, inflamed varicose veins, wounds healing slowly, premature aging and sub-fertility. When Vitamin E is in short supply symptoms may include acne, anemia, muscle disease, dementia, cancers, gallstones, shortened red blood cell life span, spontaneous abortion (miscarriage), and uterine degeneration.

**Dosage**

The dosage underneath is the Recommended Dietary Allowance (RDA), but 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.

Males 300 IU (10 mg) per day and females 8 mg per day.

**Toxicity and symptoms of high intake**

Toxicity is not easily reached. High intakes may induce diarrhea, nausea or abdominal wind. People on anticoagulant medication should not take more than 1,200 IU per day.

**Other interesting points**
When buying a supplement you often see "d-alpha-tocopherol" on the list of ingredients - that means that the Vitamin E is from natural sources, whereas "dl-alpha-tocopherol" will indicate that it is from synthetic origin. As such the origin of the vitamin does not influence the efficiency thereof.

**Food sources of vitamin E**

Vitamin E is found in nuts, oils, vegetables, sunflower seeds, whole grains, spinach, oils, seeds, wheat oils, asparagus, avocado, beef, seafood, apples, carrots, celery etc.