CALCIUM

Most of the supplements on the market are ground up shells, rocks, or coral. These are not normal foods for our digestive tracts to deal with. "Tums" contains calcium carbonate, very difficult to digest; it also contains aluminum. Calcium needs acid to help its digestion - usually this in the form of hydrochloric acid or vitamin C. Our best sources of calcium comes from plants which have absorbed calcium from the soil. Other natural sources are bones (eg. sardines, canned salmon, meat or poultry bones used in soup to which acid such as tomatoes have been added). Our forefathers used to eat greens high in calcium, and they made soup from beef or chicken bones to which they added tomato - the natural acid of the tomato would pull the calcium out of the bones into the soup, making it very nutritious.

Taking natural sources of calcium into the body as our ancestory has acclimatized to, ensures a slow and natural release of calcium for use into our body's system.

Many people experience problems taking calcium supplements:
- constipation or diarrhea - stones forming in organs - finger nodules forming
This may be an indication that your body, most likely the kidney and perhaps the parathyroids, are not functioning well and the calcium is not being processed correctly. The answer of course is to help cleanse and strengthen these organs, but also to look for other sources of receiving calcium into the body. Foods and herbs are the easiest way for the body to accept calcium. Here is a list of the best foods and herbs to consume for high calcium content:

FOODS: Seaweeds Bok Choy Sesame Seeds Hazelnuts Parsley Soy Milk (without additives)
Chick peas Spinach Raisins Peanuts Lentils Parsnips
Egg Yolk Broccoli Lima beans Walnuts Halibut Salmon
Almonds Sardines or Tuna with bones Pumpkin seeds

HERBS: Comfrey Horsetail Oat straw
also: Dandelion Cleavers Chamomile

If you wish to take calcium supplements here is how they absorb:
Carbonate is difficult to absorb unless you have high stomach acid.
Lactate, Citrate, Acetate, Gluconate absorption is about 27-32%
Choose chelated forms of calcium as well as a mixed variety (more like what nature produces). Many come bundled with hydrochloric acid (HCl), Vitamin C, and Vitamin D to help with the assimilation.

CALCIUM, BONE LOSS and MALABSORPTION

Loss of calcium from your bones leads to the thin, porous bones of osteoporosis. Osteoporosis is caused by hormonal imbalance, hypothyroidism, enzyme and other nutritional deficiencies, and bone calcium loss and calcium malabsorption due to dietary factors. Other factors that induce bone loss are exposure to heavy metals (especially aluminum in baking powder/cookware/antacids and cadmium in cigarette smoke; conditions such as hyper-parathyroidism (too much parathyroid hormone), malabsorption and colon problems, the inability to convert Vitamin D to its hormonal form due to low magnesium or inadequate HCl (hydrochloric acid), lactose intolerance, low phosphorus levels (which leads to the deposit of calcium in soft tissue), excess phosphorus (which leads to the loss of calcium from hard tissue, too much or too little exercise, and stress.

A proper hormonal balance is essential in preventing and reversing osteoporosis. Adequate progesterone is of importance because this hormone is necessary for building new bone. The thyroid gland fills several vital functions regarding bone health. Thyroid hormone promotes both bone resorption and new bone formation, and is needed for the manufacture of progesterone from cholesterol. Thus, hypothyroid has serious detrimental effect on the bones.

Environmental estrogens and estrogen replacement therapy contribute to estrogen dominance (excess

estrogen in relation to progesterone) which, without the adequate balance of progesterone's bone-building function, promotes bone loss.

Loss of calcium from bones leads to the thin, porous bones of osteoporosis, however, lack of dietary calcium is not the usual source of increase in incidence of osteoporosis. In addition to the causal factors mentioned above, the standard American diet of refined, processed foods, high phosphorus soft drinks, and high protein, sugar and salt consumption is the dietary culprit. Other dietary practices that increase the likelihood of calcium excretion and bone loss include excess intake of sugar, coffee and alcohol.

The effect of a nutrient-depleted diet is twofold. Without proper nutrients, the body can't absorb the calcium ingested in food or supplement form and is forced to draw it out of the bones to remedy the deficit. Further, inadequate nutrition fails to supply the body with the range of nutrients needed for bone rebuilding. Thus, poor diet both contributes to bone loss and prevents bone formation.

The high phosphorus content of red meat (and high phosphorus soft drinks such as colas) contributes to bone loss. Consuming large amounts of phosphorus can raise the levels in the blood, skewing the normal calcium to phosphorus ratio. This causes the parathyroid glands (endocrine glands close to the thyroid)) which help regulate calcium and phosphorus metabolism, to pull calcium from the bones to supplement blood calcium levels. Most of the body's calcium is (or should be) in the bones and teeth, with some in the tissues and blood. The small percentage in the blood is essential to the function of vitamin D and the parathyroid hormones (and to the blood-clotting mechanism and muscle and nerve function), therefore it is also vital to bone health as well as calcium metabolism.

Along with these factors, the proper metabolism of calcium depends on adequate digestion of protein, sufficient hydrochloric acid (HCl) for digestion, proper blood pH levels, the proper ratios of both phosphorus and magnesium to calcium and the presence of many nutrients. These nutrients include appropriate levels of vitamin D (which the body must be able to convert to its hormonal form), vitamins A, C, E and K, and minerals such as boron, sodium, zinc, copper, silicon and strontium. Adequate fatty acids and the proper hormonal balance are also required.

Ultraviolet from the sun is important in calcium metabolism too. It converts skin oil to Vitamin D, which transports calcium from the stomach into the blood. Certain fatty acids, especially oleic acid (present in milk, butter, extra virgin olive oil) are vital in the transport of calcium from the blood to tissue. If you have vitamin D, but not enough essential fatty acids to provide transport, your blood calcium level will increase at the expense of your tissue calcium level. If your skin itches or you get hives, welts, or cold and canker sores when exposed to the sun, you may have tissue calcium starvation due to an essential fatty acid deficiency.

Sometimes calcium is deposited in the soft tissue rather than in the bones where it is needed. There are several causes for this. One important factor is the pH of the blood which is normal in the narrow, slightly alkaline pH range of 7.35 to 7.45. To maintain this range, the blood must be keep an adequate level of acidity in the form of hydrogen ions and chloride ions, plus just the right amount of alkalinity in the form of bicarbonate ions. To accomplish this, it is important to ensure optimum digestion of foods either by eating lots of raw foods and/or by taking a multiple digestive enzyme supplement with meals. For example, inadequate digestion of protein, lowers your pH (makes it more acidic) and your body will not be able to properly utilize calcium.

Common over the counter supplements also upset the pH balance, leading to digestive disturbances which in turn result in further calcium metabolism problems. For instance, calcium carbonate supplements, such as Tums, exert an alkaline influence on the blood and cause calcium to precipitate in the urine, the stool, and, in the worse case scenario, in the soft tissues. When the blood is too alkaline, adequate HCl is not available for digestion in the stomach.

The natural way to raise acid to an optimum level is to digest protein with protease, which supplies the necessary hydrogen ions, and to increase chlorides with lipase. Chloride and other minerals are carried in the blood by lipase, so if you are low in lipase, you will not be able to maintain an adequate chloride

level.

On the other hand, acidifying supplements such as betaine HCl, used by people who think it will help with digestion, cause excess acid reserves in the blood. This has far-reaching digestive consequences because pancreatic enzymes are activated in the duodenum (upper end of the small intestines, beginning at the connection to the stomach) only at an alkaline pH. Once again, be careful of random supplementation, as it can throw off your body chemistry, compounding the problems you thought you were treating.

You cannot get all of the nutrients required for bone health in pill form. If simply taking vitamin and calcium supplements prevented bone loss, osteoporosis would not be so widespread in the North America today. Many people are calcium deficient even though they take calcium supplements. These people cannot absorb or utilize the calcium supplements for any combination of the reasons discussed above.

REASONS WHY YOU MAY NOT BE GETTING ENOUGH CALCIUM OR HAVING BONE LOSS:

* **Low Stomach acid prevents proper absorption of calcium. Taking hydrochloric acid or a little apple cider vinegar helps low stomach acid. Also need Iodine, Salt, and Vit. B1.**
* **Lack of Magnesium. Calcium works better for the body if magnesium is taken with it.**
* **Not enough Vitamin D present. Sunshine or Vitamin D help calcium work also. Vitamin C also needs to be present.**
* **Boron deficiency accentuates Vitamin D deficiency and helps prevent osteoporosis. Boron is found in apples, carrots, grapes, leafy vegetables, nuts, pears, grains - maximum dosage is 3 mg daily if in supplement form.**
* **Low phosphorus levels**
* **Ingestion of excessive phosphorus and magnesium hinders the uptake of calcium. Both are needed however for the proper utilization of calcium - just not excessive. Don't exceed the amount of magnesium or phosphorus to calcium.**
* **The worst community for osteoporosis: the Eskimos whose diet is mostly protein which is high in phosphorus - also they eat very little vegetable matter which is a better quality of calcium.**
* **Amino acid Lysine is needed to absorb calcium. It is found in cheese, eggs, fish, lima beans, potatoes, soy products and yeast.**
* **Hypo thyroid (Low functioning thyroid)**
* **Hyper-parathyroids (Excessive functioning parathyroids)**
* **Inadequate amount of progesterone**
* **Presence of aluminum or cadmium in the body**
* **Malabsorption and/or colon problems**
* **Lack of enzymes protease and/or lipase**
* **Heavy exercising hinders calcium uptake. Moderate exercise however is helpful.**
* **Taking iron at the same time as taking calcium reduces the effect of both.**
* **Soft drinks are lethal (esp. to menopausal women). They are high in phosphorus (and sugar). Too much phosphorus leaches calcium out of the bones.**
* **Caffeine contributes to calcium loss.**
* **Taking diuretics leaches out calcium unnecessarily. Use homeopathic supplements instead.**
* **Consuming too much salt causes kidneys to excrete more calcium. If you crave salt, take Nat Mur 6x homeopathic once a day for a week and you should return to moderation.**
* **Solanum in vegetables contain calcium inhibitors. Tomatoes are the worst, then potatoes, eggplant, bell peppers.**
* **Other calcium leachers: marijuana, concentrated sweeteners, sweet foods, too little exercise.**
* **Fluoride shows it doesn't add bone mass to the spongy inner layer of bone. Black tea has 1-4 mg fluoride per cup. Fluoride may increase density in the spine but does not do so for arms and legs.**
* ***Large amounts of phytic acid which is found in whole grains and cereals may inhibit the absorption of calcium - especially we notice when bran is taken with calcium.**

* **Too much oxalic acid may interfere with calcium absorption: as in almonds, chocolate, beet**

greens, cashews, chard, cocoa, rhubarb, soybeans, spinach.

* If your body is in an acid state you need an alkaline type calcium (eg. lactate). If your body is in an alkaline state, it is better to take an acid type calcium or to add hydrochloric acid supplement when taking calcium if it is not already in the supplement.
* Taking channel blockers and high blood pressure medication interferes with calcium absorption.

TO HELP CALCIUM ABSORPTION:

* Adding a little boron, Vit. D and Vit. C as food or in supplement form may help absorption.
* Make sure you are taking some magnesium with the calcium.
* Take calcium throughout the afternoon and evening and before bedtime in divided doses for maximum effectiveness.
* Do weight bearing exercises. Lifting weights increases bone density, helps calcium get to the bone area.
* Drink herbal teas that are high in natural calcium: horsetail grass, oat straw, comfrey root, lobelia helps get the calcium more easily into the body. It is said the calcium derived from vegetables is much easier for the body to absorb.
* Avoid those things listed in the previous list.

ENZYMES TO HELP

Many women subject to osteoporosis benefit from taking extra protease and/or lipase enzymes. Protease, the enzyme that digests protein, is required to carry calcium in the blood. Without proper digestion of protein, both protein-bound and ionic calcium levels in the blood will not be adequate. Lipase is required to carry calcium across the intestinal wall and for the production of female hormones. Thus a deficiency in either of these enzymes could contribute to osteoporosis.

MILK SUBSTITUTES

Note Milk (100g) contains only 188 mg calcium and .5 mg iron!

Food (100 g)	Calcium	Iron	Food	Calcium	Iron
Hijiki seaweed	1400	n/a	Spirulina	131	n/a
Wakame seaweed	1300	n/a	*Soy Milk	123	.4
Kelp	1100	100.	Chick peas	92	7.1
Bok choy	1093	100.	Black olives	87	1.6
Kombu	800	n/a	Walnuts	83	2.1
Sesame Seed	580	5.2	Okra	82	.7
Agar Agar	400	n/a	Spinach	81	3.0
Nori seaweed (sushi wrap)	260	n/a	Raisins	78	3.3
Kale	225	2.4	Peanuts	74	1.9
Turnip greens	191	2.4	Lentils	59	7.4
Hazelnuts	195	2.0	Parsnips	57	.7
Parsley	203	.2	Pumpkin seeds	51	11.2
Dandelion greens	187	3.1			
Brazil nuts	186	3.4	n/a = data not available		

* So Nice Original brand

OTHER FOODS HIGH IN CALCIUM: Sardines with bones, Tuna with bones, Sunflower seeds, Egg yolk, Broccoli, Tofu, Lima Beans, Walnuts, Halibut, Mackerel, Salmon, Okra, Almonds.

WHAT CALCIUM CAN DO FOR YOU

- helps you sleep better
- regulates heartbeat
- helps blood to clot
- balances acid/alkalinity in the blood
- for muscle growth and contractions
- for nerve transmission
- for iron utilization
- helps activate several enzymes for nutrient digestion

SPECIAL INFORMATION CONCERNING MAGNESIUM

Notes:

- Magnesium may be the most deficient mineral in our foods today due to our farming methods.
- the body contains 20-28 grams
- it is found in bones, soft tissues, spinal fluid, blood
- it is known as tranquilizing mineral, it calms, relaxes the muscle tissue (including the heart)
- all forms of oral magnesium are better absorbed when taken with food.

Types:

- magnesium glycinate (chelated magnesium) - by attaching magnesium to the amino acid glycine (and lysine), transports the mineral across cell membranes better. Absorbed into the blood stream quickly. The magnesium (elemental) content per tablet or capsule is usually 100 mg.
- magnesium oxide is often recommended. It is the most dense magnesium compound and often used in mineral supplements; it is bound to oratic acid. It contains 300 mg of elemental magnesium per 500mg tablet but is not well absorbed. Only about 4% of its elemental magnesium is absorbed or about 12 mg out of a 500 mg tablet.
- magnesium carbonate contains 125mg of elemental magnesium per 500 mg tablet, poorly absorbed. Magnesium carbonate is also the powder used by gymnasts and weightlifters to improve the grip on objects such as the apparatus or lifting bar.
- magnesium gluconate contains 27 mg elemental magnesium per 500mg tablet. it is easily absorbed and quick acting. Helps elasticity of bones and muscles, regulates blood pressure and insulin levels.
- magnesium citrate contains 80 mg of elemental magnesium per 500 mg tablet. It is far better absorbed than magnesium oxide. The water soluble form (eg. Natural Calm) contains 205 mg elemental magnesium per teaspoon, is totally soluble in hot water and is highly bioavailable.
- magnesium maleate (aka malate) contains 56 mg elemental magnesium per 500mg tablet. This is often used for fibromyalgia, chronic fatigue syndrome. It combines magnesium and malic acid. Easy to absorb. Soothes and energizes muscle cells.
- magnesium orotate. Orotic acid from whey is changed into orotate form which is then bonded to the magnesium. Tablet is coated to prevent breakdown by stomach acid. The magnesium orotate is easily absorbed and the magnesium is not released from the orotate until it reaches the liver. This form used for treating liver disease, high cholesterol, heart disease and blood clots. It contains only 31 mg of elemental magnesium per 500mg tablet, it is well absorbed and has been effective in daily intakes of 3000mg (186 mg elemental).
- magnesium citrate and magnesium sulphate (epsom salts) are often used for their laxative action
- magnesium hydroxide (antacid) has a leaching effect on magnesium, calcium, phosphorus. Magnesium hydroxide is used in milk of magnesia. Magnesium hydroxide is not well absorbed.
- magnesium in chlorophyll form is used successfully as deodorant
- bonemeal also contains some magnesium. Absorption is low and phosphorus levels are too high.
- magnesium stearate is used as filler in supplements. It is known for its lubricative properties which helps prevent tablets from sticking to equipment in processing.
- dolomite (type of limestone) high in calcium and magnesium. This type is difficult to digest. If used, take hydrochloric acid or glutamic acid with to help break down. Absorption is low.
- magnesium sulfate (aka sulphate) is commonly called Epsom salt, usually used in a bath soak for sore muscles. Magnesium sulfate is also used to correct magnesium deficiency in the soil since magnesium is an essential element in the chlorophyll molecule.

Note: Magnesium gluconate is utilized well by nerves. Nerve involvement eg. fear, nerve twitching, muscle twitching, bed wetting, restlessness, grief apprehension and so on
Magnesium phosphate is indicated by cramp-like contraction of muscles
Magnesium oxide when muscles ache; pain and twisting becomes stiff. It is a counter

player to calcium.
Magnesium glycinate for muscles, sleep problems.
Magnesium malate is well absorbed, works on muscle function, carbohydrate, fats & protein metabolism, often used for fibromyalgia.
Magnesium aspartate absorbs easily for muscle function
Magnesium orotate is often used to help people sleep. and for cardiovascular health

Sources of Magnesium:

- **farming methods rarely put back the magnesium that has been taken from the soil and crops, but in general here are the best sources of magnesium: parsnips, all leafy green vegetables, parsley, buckwheat, wheat bran, wheat germ, kelp, figs, soybeans, corn, apples, almonds, brazil nuts, cashews, pecans, peas, carrots, pumpkin seeds, blackstrap molasses, sea salt, brewer's yeast, avocados.**
- **milk has magnesium but the synthetic Vit D they add can bind to magnesium, reducing absorption. Synthetic form of Vit D binds mag.10 times more than does the natural.**
- **polishing rice, milling corn, cooking vegetables in water, all depletes the magnesium to some extent**

Some principal containing foods (parts per 1000 parts of food)

Tomato	13	Celery	6	Carrots	3
Spinach	11	Beans	6	Walnuts	2
Lettuce	11	Cucumber	4	Oranges	2
Bran	9	Figs	3	Grapefruit	1

Function of Magnesium:

- **involved in metabolism of carbohydrates and amino acids, synthesis of ATP and bone metabolism**
- **essential to nervous activity and muscle contraction**
- **activates over 30 enzymes, particularly those to do with carbohydrate, fat and protein metabolism**
- **often called the circulatory mineral because of its vast regulating effect on muscle contraction. It also helps in the utilization of Bit. B6, C and E**
- **necessary for proper functioning of pituitary gland (master gland of endocrine system)**
- **Synthetic Vitamin D (calciferol) binds magnesium and is 10 times more active than natural Vit. D.**
- **aids absorption and metabolism of calcium, phosphorus, sodium, potassium**
- **treating neuromuscular conditions. If deficient can have effect of stimulating instead of calming**
- **has been linked to strengthening bones and teeth when present in water, decreasing dental cavities, bones healed faster**
- **regulates heartbeat, helps control inflow/outflow of calcium from heart cells**
- **useful in reducing high blood pressure**
- **relax muscles surrounding arteries**
- **reduces blood cholesterol**
- **keeps calcium and phosphorus in solution in urine**
- **optimum magnesium serum and cellular levels help to regulate so many body functions that renal magnesium excretion is quickly stopped when either magnesium or calcium intake drops very much.**

Absorption of Magnesium:

- **kidney disease, diabetes, pancreatitis, digestive disorders, radiation exposure, chronic alcoholism interfere with mag. absorption**
- **diuretic drugs can lower mag. levels by increasing excretion**
- **aldosterone, hormone produced by adrenal glands, controls mag. excretion**
- **cortisone affects distribution of mag. in body, increasing the uptake by the appendix and heart muscle**
- **fluoride bonds to magnesium forming insoluble salt**
- **tetracycline interferes with magnesium metabolism; testosterone, thyroxine and digitoxin**

suppress magnesium activity

- **assisted by Vit D, C, B6, calcium and phosphorus, controlled by parathyroid gland**
- **35-40% absorbed through small intestine by active transport**
- **as magnesium intake increases, absorption falls.**
- **when mag. intake low, 73% absorbed. When high, 25% absorbed.**
- **many antacids contain magnesium in form of magnesium hydroxide, unabsorbable form which tends to bind up some dietary magnesium, calcium and phosphorus and carry them out of the body.**

Dosage of Magnesium:

- **diet low in carbo and high in protein, more magnesium required**
- **RDA 300 mg females and 350 males**
- **nutritionists suggest 600-1000 mg daily**
- **when calcium and phosphorous intake is high, magnesium intake should be a 2:1 ratio. If diet is low in magnesium, a supplement of 1:1 magnesium to calcium is recommended.**
- **too much magnesium in diet reduces calcium absorption**
- **need for more magnesium when blood cholesterol is high, protein intake is high, or carbohydrate intake high**

Magnesium Deficiency Symptoms:

- **deficiencies are widespread. Even the type of water we drink can determine whether we maintain magnesium reserves. Populations consuming magnesium rich hard water have less cardiovascular disease than those who drink soft water.**
- **deficiency can lead to kwashiorkor (a form of malnutrition occurring when there is not enough protein in the diet), thrombosis (blood vessel clotting), calcium oxalate kidney stone formation, uncontrollable muscle tics and premenstrual syndrome symptoms such as nervousness and a craving for sweets.**
- **deficiency can experience anxiety attacks, heart palpitations, breathing**
- **due to under consumption of green vegetables, alcoholism**
- **diet high in carbo, the concentration of magnesium containing enzymes needed to break carbohydrates down is high and deficiency may result**
- **deficiency interferes with pituitary control of adrenal glands and can result in overproduction of Adrenalin. some think this has effect upon hypoglycemia and diabetes**
- **many feel lack of mag. has effect on thyroid gland function through the pituitary gland**
- **elderly vulnerable to deficiency as they may have less mag. in their diets, have decreased absorption, and may use prescription drugs that interfere with metabolism and storage**
- **pregnant women at risk, linked to toxemia, high blood pressure, vasospasm, premature birth, regarded fetal growth, muscle cramping, coagulation disorders.**
- **individuals consuming processed foods in the form of fast food or packaged goods have a higher risk of magnesium deficiency because this mineral is easily lost during food processing. 59% of magnesium present in whole wheat is lost during processing. Regular use of diuretics or caffeinated beverages may also induce magnesium.**
- **can be the result of a number of risk factors including long term use of diuretics, digitalis, antibiotics, chemotherapy, alcohol and excessive fats or protein intake. Even living in a hot**
- **climate is a risk factor since humans do not acclimatize to magnesium loss through perspiration as we do for potassium and sodium excretion.**
- **the way we react to stress can also deplete magnesium levels. Type A individuals release more fatty acids into their blood under equal stress than do Type B individuals. This results in net loss of serum magnesium.**
- **Oral contraceptives or estrogen replacement therapy may deplete body stores of magnesium by increasing its uptake and utilization by soft tissues and bone.**
- **fibromyalgia sufferers, diabetics, and alcoholics are more likely to develop long term magnesium deficiencies.**
- **variation of mag. level in spinal fluid can cause convulsions**
- **linked to blood clots in heart and brain and calcium deposits in blood vessels, kidneys, heart**

- **Aching neck muscles should muscles**
- **allergy to wool**
- **burning sensation in mouth**
- **bedwetting**
- **chilly after retiring**
- **fear**
- **insomnia**
- **depression**
- **grief-apprehension**
- **gas and wind in intestine**
- **inflated intestine**
- **nervous heart palpitation**
- **muscle jerk spasms. muscle twitching**
- **constipation**
- **restless movements of eyes, fingers**
- **yellowish whites of eyes**
- **sensitivity to noise**
- **sleep with eyes half open**
- **teeth sensitive to cold water**
- **tooth ache when nothing is wrong**
- **tremors or twitching of body**
- **winding motion of body**

Synergists:

- Vit B6, C,D, Calcium (2 calcium to 1 magnesium), phosphorus, protein
- no single nutrient is as important in the absorption and metabolism of magnesium as Vit. D is to calcium. Magnesium behaves much the same as calcium in its relation to other nutrients (see calcium info).

Antagonists:

- alcohol, corticosteroid drugs, diuretics, caffeine
- calcium and magnesium are mutually antagonistic and compete for absorption sites, but calcium and vitamin D increase magnesium absorption. (2:1 ratio of cal to mag is best)

Toxicity:

- rare since most of its salts are cathartic eg. epsom salts and milk of magnesia are two of our modern day laxatives. Magnesium salts also have a diuretic effect and act as depressants. Excessive use of magnesium glycinate may lead to diarrhea, vomiting, fatigue, sleeplessness, nausea, muscle cramps.

Magnesium in Herbs: per 100 mg

Irish moss herb	**1960 mg**	**White willow bark**	**560 mg**
Oatstraw herb	**1200 mg**	**Pennyroyal herb**	**550 mg**
Tumeric seed	**980 mg**	**Devil's claw rt**	**544 mg**
Licorice root	**965 mg**	**Burdock root**	**537 mg**
Kelp	**867 mg**	**Chickweed herb**	**529 mg**
Nettle leaf	**860 mg**	**Althea root**	**518 mg**
Senna leaf	**777 mg**	**Pumpkin seed**	**514 mg**
Elecampane root	**750 mg**	**Bupleurum root**	**500 mg**
Peppermint leaf	**661 mg**	**Astragalus root**	**500 mg**
Boneset herb	**600 mg**	**Siberian ginseng root**	**500 mg**
Dulse	**590 mg**		

Other herbs that contain magnesium (specific mg unavailable)

Carrot leaves	**Mullein leaves**	**Broom tops**

Meadowsweet **Primrose** **Walnut leaves**

SPECIAL INFORMATION CONCERNING VITAMIN D(D^3)

In 2006 an article appeared called 'Vitamin D and Influenza' that started to change the way we think about Vitamin D. Vit. D was discovered around 1920 (shortly after the 1918 epidemic) because of a epidemic disease called rickets. This hardly occurred in farm families or rural areas. It started to arise in US in 1890's, and built up to a peak in the 1920's as people moved into cities, working in factories. Ricketts in a child: the bones don't develop properly. The mystery was solved when they found you needed a little bit of vitamin D in order for a child's bones to develop normally. Since 1930-40 they have added Vitamin D to milk and it present now in infant formulas.

So for 80 years we knew that you needed a little to prevent rickets and help calcium absorption, and that it was present in food. Then Vit. D researchers found we don't need just a little tiny bit, we need very robust amounts.

A white person, standing in the sun in the summertime, around noon, for 30-40 minutes with arms, chest bare - will get about 20,000 IU. If they were sunbathing, it would only take 20 minutes. If they were African with dark skin it would take about 3 hr to get the same amount of Vit. D.

Farmer ancestors had vast more amounts of Vit. D in their blood than city dwellers who stay indoors and who use sunscreen when they go outdoors. Modern americans have about 1/3 of Vit. D in their blood than our farmer ancestors had. They found almost every cell in the body has a Vit. D receptor and it has many many more roles than just bone development and rickets.

The emerging knowledge demonstrates that severe influenza or mortality from influenza is a Vit. D deficiency and that if you have optimal levels of Vit. D you most likely will not get influenza.

The cells in the respiratory tract have proteins sticking out from their surfaces (immunocompetent pepticides) that allow them to do their role. When they come into contact with a bacteria or certain viruses that have coats on them such as influenza - because of the immunocompetent pepticides they mount an immune response against the invading organism. When Vitamin D binds to those cells that have Vit. D receptors, they can manufacture those immunocompetent pepticides. We understand now that if your Vit. D. level is too low than your respiratory immunity is also too low.

When tuberculosis was a threat last century, it was well known that sunbathing in the summer helped cure tuberculosis - now we understand it probably was building up your Vit. D D levels to help throw off infection.

Vitamin D stimulates immunomodulatory cytokines. Whenever you have inflammation or immunity, at some point, in equal measure to stimulation there is also something to counteract the stimulation so it doesn't get out of hand. You wouldn't want an immune reaction or inflammatory reaction to start burning you up. A bit like a car - nice to have a petal to give it gas, but you also need to have something there for the brake. The anti-inflammatory side is supported by Vit. D and the immune side (respiratory tract) is also supported by Vit D.

One of the ways people die from influenza is because as the surface of the respiratory tract becomes infected, your body mounts an immune response against the infection and part of that immune response is inflammation so it created an inflammatory response in the airway. When it is in proper balance and proportion this is very beneficial - you want to have an low level inflammatory response in order to fight off a virus. However if you are Vit. D deficient, that inflammatory response becomes excessive and the excessive inflammatory response is called a CYTOKINE STORM. If too severe, the inflammation can destroy the lining of the epithelial tract and now the person will basically suffocate and this is one of the ways people die of influenza. Vit D not only activates those receptors to manufacture an immune response but activates those components of the immune system that puts the breaks on the cytokine storm.

Why do people get influenza almost exclusively in the winter time? It is a winter time epidemic. It starts

to appear in November and build to epidemic proportions in late January. Feb and March are usually the peak of influenza season. This is exactly when people's Vitamin D levels are lowest due to lack of sunshine.

There are 2 kinds of ultra violet that comes from the sun - UVA and UVB radiation. UVB comes from the sun through your skin and interacts with cholesterol to make Vit. D. So it is manufactured in your skin from UVB. UVB is only formed when the sun is higher than 45 degrees in the sky. Rule of thumb is if your shadow is longer than you, you won't be making Vit. D. Therefore between 10 in the morning and 2-3 in the afternoon is when you make Vit. D. Earlier or later and you won't make Vit. D.

This is a problem in northern latitudes. Above 30 degrees latitude even if you sunbathe in the nude in during the winter you won't make any Vit. D - because the sun never gets above 45 degrees. For example: In Boulder, Colorado on Oct 20 the sun's position falls below 45 degrees and doesn't get above 45 degrees until Mar 20. Generally in Canada, we take Vitamin D supplements from October to April each year and if you don't get out in the sun with some bare skin from April to October, then you take Vitamin D all year.

If you look at our ancestry, we were a tropical species, evolving under the tropical sun for 2.4 million years. We evolved walking around naked in sunlight getting huge amounts of Vit. D. We were basically saturated with Vit. D. We can absorb about 20,000 IU, after that the body puts on the brakes and inhibits excess absorption.

<u>Vit. D Deficiency May Cause:</u>
Fibromyalgia, Chronic Fatigue
M.S.
Depression
Muscle Weakness (hard to lift things)
Osteo malacia (bone ache, depressed and muscle weakness, often a problem in the northwest during the winter). In a child when the Vit. D gets down to a certain level they get rickets - in an adult when they get down to a certain level, they get Osteo malacia).

<u>Serum Levels:</u>
They examined soldiers in Australia: They looked at those with 15 nanograms per millilitre of circulating Vit. D3 and those with less than 15 nanograms. Those with less than 15 had twice the respiratory infections.

If you get it up to 38 nanograms per ml you reduce colon cancer by 40%
If you get it up to 50 nanograms per ml you cut your breast cancer risk in half

When you breast feed, if you drop below 50, you are starving for it and grab it all, depriving the baby. Breast feeding moms lacking Vit. D puts infants at risk for deficiency. If you were living under the best conditions, mom and baby would both be out in the sun and mom's level would be about 50+. A California lifeguard in the summer has about 70-80 nanograms per ml.

They tried to give a toxic dose of Vitamin D - up to 150 nanograms - and found no toxicity. If you do get Vit. D toxicity you start to deposit calcium in your organs and system which is really dangerous. This only occurred in an industrial accident when they accidentally gave 400,000 IU instead of 400 IU and after 20 days they got sick.

They have raised the upper safe limit to 10,000 IU a day but that number is climbing rapidly. The only exception is if you have Sarcoid or Cancer Lymphoma which have altered calcium metabolism and so they recommend not supplementing with those conditions.

It is suggested that you sunbath in a bathing suit for 20 minutes, then to avoid overexposure, use your sunscreen. If you only uncover arms and legs, it takes longer.

Up here in the North, sun energy peaks in August then rapidly starts to decline. It starts again in April to

rise. This is why we have seasonal colds and flus. December and Jan our levels fall below 15 and everyone by February is below 15 - and this is flu season.

It is important to supplement elderly with Vitamin D. If you put a 70 year old and a 30 year old out in the sun, - the 30 year old will produce Vit. D a lot easier and more abundantly. Seniors typically don't go out in the sun as much either.

Vitamin D is stored in the liver as 25-hydroxy vitamin D (calcidiol). This is what doctors are measuring when you have your D3 levels checked. Vitamin D is activated by the kidneys to 1,25 hydroxy vitamin D which is the active form of Vitamin D that is responsible for its biological activities.

Vitamin D does more than support bone health. It helps keep your immune system strong and balanced. It has anti-inflammatory properties, helping the intestinal integrity, correlating with a decreased risk for a number of cancer types.

VITAMIN D2

There is also Vitamin D2 (Ergocalciferol). D2 is used to treat hypoparathyroidism (a decreased functioning of the parathyroid glands), and rickets which is caused by a Vit. D deficiency or low levels of phosphate in the blood. Taking excessive amounts of Vitamin D2 comes with serious warnings and therefore should be given only as prescription. D2 is plant based and usually a prescription will be 50,000 units for each capsule.

Vitamin D3 is fat soluble and can be purchased as drug stores, health food stores, and supermarkets.

VITAMIN K2

Many Vitamin D (D3) supplements include Vitamin K2. Vitamin D controls the absorption of calcium into the blood and K2 controls where the calcium ends up. If calcium doesn't find its way to the bone tissue, it can end up in arteries which becomes atherosclerosis, narrowing the flow of blood. Vitamin K breaks down calcium in our bodies, helping prevent these hard deposits of calcium and fatty material from forming in the arterial walls. Cardiovascular is one of our leading causes of death.

Vitamin K1 (phylloquinone) is found in leafy greens such as cooked kale, cooked mustard greens, raw chard, cooked collard greens, natto, raw spinach, cooked broccoli., vegetables and some plant oils. But Vitamin K2 (menaquinone) is fat soluble and is found in dairy (eg. cheese), animal products and fermented foods such as Kefir, Sauerkraut, Yogurt. Other sources are eggs that come from pasture raised hens; grass fed butter and cheese; organ meats like liver.

Studies reveal a higher K2 intake improves bone density and reduces the risk of bone fractures. It is also listed a playing a vital role in blood clotting and an inadequate intake may cause bleeding, further weakening the bones and increasing risk of developing heart disease. Research is continuing to see if K2 can slow or stop cancer cell activity but so far are focusing only on liver and prostate cancers.

HOW MUCH VITAMIN D TO TAKE

This is tricky. In the last century, we were told by Health Canada to not take more than 400IU daily or it was toxic. Then near the end of the century, they raised it to 800IU. These days they say take 4,000IU or more a day and increase that to 20,000-30,000IU for a few days if you have an infection like influenza or a cold.