

# POTASSIUM IN FOOD, to treat rheumatoid arthritis and heart disease.

by Charles Weber, MS

Someone who has rheumatoid arthritis and therefore has a bad deficiency in potassium [LaCelle] should be able to acquire the as much as the missing fifty or sixty thousand or so milligrams missing from the one hundred thirty to two hundred thousand normally present, which potassium is usually almost 2000 milligrams per kilogram of weight [Flink ] to 2,650 or so (depending on the weight of non fat tissue) again in only a few months or less and largely heal or cure any reversible damage (such as possibly the fundamental changes in potassium ion channels of arthritics [Trujillo] ) in only a few more weeks using foods in one's diet alone. This should be possible even though arthritics tend to have a higher amount of the potassium secreting hormone, aldosterone, than normal people [Khetagurova] do. It is only necessary to select the right food and [prepare it correctly](#). Large amounts of potassium are possible from food alone as some South American Indians receive over 8 thousand milligrams per day from their food [Oliver]. Potassium can be increased more quickly with [potassium chloride supplements](#) also, but unprocessed food is the safest way, and can rarely cause [imbalances](#) or dangerous surges where the kidneys are in reasonable health. When they are not, you should be under the care of a doctor. An additional reason is that potassium can not be absorbed efficiently in the presence of a [magnesium deficiency](#) probably partly because the body cells can not absorb potassium [Ryan, p100] {or at [this site](#)} and magnesium tends to be correlated with potassium intake. [Furthermore, a magnesium deficiency increases aldosterone secretion, which hormone increases potassium excretion.](#) Total body magnesium does not predict a deficiency, but blood serum must be low for that. If blood magnesium is 25% low, the enzymes depending on magnesium fail to operate adequately, including those responsible for its own absorption. [from a dead URL] [See this site for an evaluation of magnesium.](#)

Inositol may be similar to magnesium in its affect [Bian] [Allard] also (see this site for a discussion of [nutrients which affect the potassium pumps, including inositol, especially as pertaining to pain during diabetes](#)) and further information about [inositol at this site](#).. Furthermore there is evidence from rats that [excess chloride can increase high blood pressure \(hypertension\)](#).

Arthritis = rheumatoid arthritis = RA in this article



We subscribe to the [HONcode principles](#) of the [Health On the Net Foundation](#)

[A summation of potassium and copper, click here.](#) Do not rely solely on this discussion of nutrients, but seek other medical consultation if you are sick.

# CONTENTS

of other chapters [Back to INTRODUCTION chapter](#) - - II. [Arthritis Research](#) -- III [Arthritis and Potassium](#) -- IV [Roles of Potassium in the Body](#) - - V. [Electrolyte regulation \(sodium and potassium\)](#) -- VI. [Purpose of cortisol](#) -- VII. [Copper nutrition and physiology](#) -- VIII. [Potassium Nutritional Requirements](#) -- IX. Potassium in Food – X. [Processing Losses](#) -- X,cont. [Losses in the kitchen](#) -- XI. [Potassium Supplementation](#) -- XII [Side Effects and Heart Disease](#) -- [Strategies for Chronic fatigue syndrome \(CFS\) and fibromyalgia](#)

XIII. [High blood potassium](#)

## INTRODUCTION

When attempting to increase our potassium intake to treat or cure rheumatoid arthritis, it is desirable to know which foods are high in potassium. It is not sufficient to know the amount of potassium in a given weight of food. What determines how much food we eat is largely determined by the number of calories contained in it. We eat until our appetite is sated by a sufficient intake of food energy, and then we lose our appetite. Therefore information on potassium in foods is much more useful if it is expressed as weight of potassium per calorie [Weber].

The justification for using Calories contributed by fat or oil in the [potassium in foods table](#) depends on the assumption that fat and oil contribute as much to appetite suppression as do carbohydrates. This is not the case short term [Blundell]. However this approach is still justified because trained muscles burn fat as well as carbohydrates [Saltin] and everyone except chronic fatigue syndrome (CFS) victims should get as much exercise as possible for there is said to be no damage to the joints [from a dead URL]. While moderate to heavy exercise has been shown to be beneficial to fibromyalgia (probably a CFS variant) [Hadhazy], exercise in a pool has been shown to give improvement in pain, anxiety, depression, and number of good feeling days were more evident than land exercise [Jentoft]. I suspect that many short sessions of mild exercise across the day would be the best way, probably for arthritis also. Furthermore the foods which I recommend are low in fat and under such circumstances a high proportion of the fat is either burned or stored in the body's fat cells [Westertape] anyway. Therefore ultimately most of the fat and oil in a healthy diet contributes to appetite suppression long term and therefore no useful purpose would be obtained by attempting to compute a weighted factor against the fat contribution. A diet high in fat is disadvantageous for other reasons, so no net problem should arise including fat calories.

It is customary to designate potassium in milligrams. If potassium content is expressed as milligrams per Calorie (mg/Cal), most foods lie between 0 and 10, and none are higher than 20. These are convenient numbers, easy to read, and make a good comparison for foods when assessing their relative potassium contents. Such a designation is much more useful in attempting to decide which foods to eat than a "per serving" designation which gives very little hint as to relative value and is actually misleading for dry

foods.

For a food content table for potassium in such a format, see [http://members.tripod.com/~charles\\_W/table3.html](http://members.tripod.com/~charles_W/table3.html) A table like that is unobtainable elsewhere in that format. This same table may be viewed in descending potassium concentration at [http://members.tripod.com/~charles\\_W/table2.html](http://members.tripod.com/~charles_W/table2.html). The Table from which these values were computed may be seen [here](#). [To access the information you must press "enter" to search, and then divide Kcal into milligrams of potassium.](#) This last table is very comprehensive, is used in search mode, and even lists all the amino acids. [It is available in a PDF printable form for potassium only also.](#) with links to PDF caloric contents and other nutrients. A site is available which shows [foods which are high in one nutrient and low in another \(including calories\)](#). This last site should be especially useful for a quick list of foods to consider first, or for those who must restrict another nutrient.

## **Our food can be divided into three main categories:**

[Take a look at a marvelous site that gives average RDR multiples for most of the essential elements in graphical form from several food groups along with average costs. Vegetables are the winners.](#)

1. Meat, fish, and dairy products, which we depend on for high quality protein (especially methionine and lysine), sodium, chloride, iodide and [vitamin B-12](#). Vitamin B12 is said to be also [present in spirulina, or blue green algae, but is thought to be an analogue of B-12 which may make a deficiency worse. Fermenting vegetables will not provide adequate vitamin B-12](#) [Rauma 1995 with comments in 1997]. Red Star T-6635+ yeast is said to be rich in vitamin B-12 derived from bacteria. [All vitamin B-12 comes from micro-organisms and is not harmful in excess.](#)
2. Vegetables, which we depend on for vitamin A, vitamin C, and potassium. They are also good sources of all the other vitamins and minerals except those listed under meat above, and vitamin D, which is not really a vitamin, but a hormone. To the extent that it is de facto a vitamin for those working and studying inside, it is present in liver, sardines, irradiated milk, cod liver oil, and tablets. For recommended amounts see [the last of this site](#). It is necessary in the body to guard against tuberculosis [Wilkinson], to gain calcium for avoiding bone loss, [to possibly inhibit cancers](#) and to retain magnesium. [It has been proposed that vitamin D has an affect dampening the immune system, especially with regard to multiple sclerosis.](#) [Cantorna] and thus dampening inflammation during arthritis, although apparently this concept has not been followed up on, [except for an epidemiological study](#). It is more likely that the affect on magnesium is involved, and thus indirectly powers the potassium pumps [Grace]. [The optimal values in the blood are proposed as 45-50 ng/ml or 115-128 nmol/liter of vitamin D.](#) It has been proposed that [vitamin D accentuates the symptoms of sarcoidosis \(thought to be a bacterial infection\)](#), and supplements or sunlight probably should not be used then. [Antibiotics have been used successfully against sarcoidosis.](#) Those authors believe that a mycoplasmin like bacteria is responsible for that disease, and suggest that similar bacteria may be involved in rheumatoid arthritis and other diseases like

it by infecting white blood cells and causing autoimmunity

3. Grains and fruit, which are primarily cheap or tasty sources of calories. Grain price is made even lower since 90% of subsidy payments are made to farmers of corn, wheat, oil seeds, rice, and cotton [Doyle]. Grains also provide a fair amount of Vitamin E and B vitamins (other than B-12). Fruits are usually fair sources of potassium and vitamin C

Foods that contain 1 milligram per Calorie or better of potassium, as do whole grains, would probably meet the minimum daily requirement for most young people. This assumes a man in good health who burns 2,500 Calories per day, which would yield the 2,500 milligrams per day or so mentioned in [Chapter VIII](#). It also assumes no drains on potassium from stress, disease (such as diarrhea), perspiration or other losses. The only time that it would be necessary to eat grains would probably be if the only vegetables eaten were leafy ones low in calories, for it is said that celery has negative calories, for instance. It takes more calories to eat a piece of celery than the celery has in it to begin with. It is said to be the same with apples. These last statements may be exaggerated somewhat.

## MEAT, EXTENDED DISCUSSION

Lean meat low in fat has fairly consistent amounts of potassium, usually about 2 mg/Cal. It can range from 1 to 3 mg/Cal. Since fats or oils have no or little water to dissolve potassium, and since they are high in calories, they are very low in potassium, approaching zero. Therefore meat with much fat in it will be lower in potassium per calorie than lean meat. Milk compares to meat as a source of potassium, and has the same dependence on fat content. The lactose in milk is difficult to digest for adults outside of the Caucasian and Semitic races and causes digestive upsets. That problem can probably be solved by adding the proper enzyme to the milk. [Also, milk is very low in copper.](#)

Eggs, like meat, are an excellent source of protein, and for normal people should make a good adjunct to the diet. You should bear in mind, however, if you are in the throes of recovering from a deficiency, that they are low in potassium. This would be expected, since the developing chick is trapped inside the egg. It has no way of excreting potassium and must end up with the correct amount, after burning some energy and making some feathers. Eggs have been given some bad press because of the cholesterol hypothesis. However there are tribes, which eat large amounts of eggs in Africa, that have a much lower heart disease rate than we do. The Masai tribe members have low cholesterol [Brown p8-9] even though heart disease is a problem. [Low cholesterol diet has little affect on cholesterol](#) (or this [site](#)), since the high blood cholesterol is probably due to impaired conversion of cholesterol to bile acid [Mann p647] and an [egg a day has no affect on cholesterol](#) .[Slater][Hu] and [Cholesterol lowering drugs](#) give a higher death rate [Mann p646], and the cholesterol level is normal in the average heart attack victim. In fact, [too little cholesterol in the body can cause health problems](#). It has been shown in some [English children that cholesterol intake has no affect on blood cholesterol, but that saturated fat in boys and energy intake in girls increase cholesterol](#). For some [possible causes and cures, see this pdf site](#). High sodium chloride (table salt) intake for 1-4 years has been found to frequently cause high blood cholesterol [Dahl]. The erroneous attitude toward cholesterol has been ascribed to misinterpretation of the data and lack of precision in semantics [Stehbens].

There have been effective treatments rejected in the past solely because they did not conform to mistaken accepted hypotheses [Goodwin]. So eggs should make a reasonable source of protein for everyone. It is probable that most of the problem with cholesterol these days is from a pervasive [copper deficiency](#). It is said that prolonged salt intake can also raise cholesterol, as mentioned above.

Most of the potassium is concentrated in the white of the egg. Egg whites are comparable to meat in content, and are in fact higher than most meat. One way to make a slight gain in potassium intake, if you are the only one deficient in your family, is to have your portion of the egg high in the whites.

Glucosamine has become popular as helpful in osteoarthritis. If it proves to have an equivalent effect on rheumatoid arthritis, I suspect the interference with potassium excretion by the ammonia generated will prove to be a considerable part of its efficacy.

## VEGETABLES

Vegetables low in starch are the best sources of potassium. They rarely go below 5 mg/Cal., and range up to 20 mg/Cal. or more. The seaweeds are poor sources of potassium. The situation may be more favorable than this, since some of the Calories measured by the USDA may be indigestible to us. They are excellent sources of iodide which may be of interest to those who live in the interior of continents and do not use iodized salt. Perhaps they would be good as occasional salad dressing in summer. I can not recommend them as a substantial replacement for vegetables, however, because of their high [salt content](#) and because I am unfamiliar with the status of their other nutrition or the possibility of iodide toxicity. 0.9 milligrams per day is said to be toxic in some people [Rauma, 1994] (However, excess iodide has been recommended against breast cancer [from a dead link] ).

If you wish to increase the variety or taste of the vegetables which you eat by growing your own perennials there is [a site which lists growth parameters of trees and shrubs](#). --or-- [This site discusses wild vegetables which are edible, and some evolutionary aspects of vegetable eating](#). You may see [a list of vegetables which will grow in partial shade at this site](#).

## GRAIN

Grain ([see evolution of seeds as food](#)) is the lowest of the major categories, and will usually run about 1 mg/Cal. Nuts are similar to grain. The bean, peanut and legume seeds are a fairly good source, usually running about 3-4 mg/Cal. They along with chocolate and other nuts are high in arginine amino acid which apparently should not be eaten when suffering from a herpes viral infection such as chicken pox, shingles, genital herpes [McCune] (see further discussion below). When first recovering from arthritis and attempting to build up your body's potassium, it would be well to use whole wheat bread and cake sparingly (and no refined flour products at all). Substitute wheat germ and yeast for some of it and vegetables for the rest. People who are intolerant of gluten protein should eat no wheat at all. A very

important consideration is to eat extremely sparingly of foods containing sugar, starch, or fat, regardless whether the sugar, starch, or fat was placed there naturally or by the hand of man. Refined flour is extremely low in potassium but is not part of this discussion since no one should ever be using that useless rubbish under any circumstances because of a number of other deficiencies. A diet high in protein has been touted as superior to carbohydrates and for people who have not [lost kidney function](#) it is probably acceptable. However, the main reason why carbohydrates have received a bad perception is probably because the criminally incompetent jerks in the processed food industry have evolved clever ways to remove or destroy essential nutrients in carbohydrates, sometimes 100% of them (white sugar, for instance).

When people speak of a balanced diet, they usually mean that you should get a fair share of each category of food each day. By so doing you make it unlikely that there will be too little or too much of any essential nutrients. If you get about equal calories from each of the three categories, you should have a reasonably balanced diet as defined by the crude definition at the beginning of this paragraph and most people will be reasonably healthy. However grain and fruit are not essential. You can probably get all your nourishment from meat and vegetables, and it is undoubtedly a [superior way](#) to eat [LaVecchia et al]. [Van Duyn]. [This is a case history in which using vegetable juice and vegetables healed a woman of arthritis](#) There was also a study which [used a so called vegan diet with vegetables and legumes to cure diabetes, but no refined food, meat, or milk which showed substantial improvement including much less loss of protein from the kidneys.](#) There also has been a study which [showed a strong negative correlation for arthritis with a usual diet versus with cooked vegetables in Greece](#) [Linos]. A similar diet, the so called mediterranean diet, [showed marked improvement in Sweden](#) [Skoldstam] and in Finland [Hanninen]. In addition, there is a suspicion that some unessential compounds in vegetables can have desirable affects against other diseases.

It is desirable to have variety in the vegetables since [almost every plant has a different mild poison or another](#) and variety prevents difficulty from any one of them. For instance parsnip root and diseased celery have a phototoxic poison [Ivie]. Each plant family is usually different from the others. Therefore, it is important to vary your menu. If you concentrate on one particular plant, you may find yourself in the embarrassing position of the man who turned orange from eating too many tomatoes and carrots, or have a vital food element tied up in the digestive tract as the oxalic acid in spinach and rhubarb is alleged to do to calcium, or much worse to be badly sickened by alkaloids as the poor people in India are sometimes when they eat only a local wild pea during a famine. Most of these toxic substances are only mildly toxic and present in small amounts in cultivated plants so variety should solve the problem satisfactorily for edible plants for most people. You can see which foods belong to which families in order to rotate and maximize the advantage at; [this site](#). One way to achieve variety is to find recipes for good tasting mixtures of food. You may see a link to a trail mix recipe in [this site](#). A fringe benefit is that mixtures of vegetables almost always taste better than individual vegetables, in my opinion. Another recipe, for a [blended vegetable drink which Harris calls a 'smoothie' is here](#) and [here](#). The suggestion to use a 50 milligram zinc supplement should not be taken though because excess zinc interferes with copper.

# MEAT

There are no toxic meats in commerce, so that variety in meat is probably not essential to take care of the above circumstance about poisons. It has been proposed that red meat is unhealthy, [but this is an invalid myth](#), and people with adequate kidneys or do not suffer from hemochromatosis (inability to excrete iron) can eat large amounts of meat safely. [There are tribes in Africa whose members make meat a major part of their diet in which degenerative diseases are very rare. Tribes that ate both meat and plant food were healthiest](#). So meat should be acceptable nutritionally to most who do not have quasi religious aversion to it. Epidemiological studies have linked red meat to arthritis [Pattison]. I suspect that the largest part of this correlation arises from a tendency for arthritics to be more allergic to some proteins, so this should disappear when the arthritis disappears. Liver is an exception to no poisons. Eating only liver can produce vitamin A and vitamin D toxicity. Another exception is fish. [Fish can contain unacceptable amounts of mercury](#) (see this [site for mercury analyses](#)) and tropical fish contain ciguatera toxin. This ciguatera is a poison of many carbon rings generated by algae, which toxin can not be degraded by heat and which is thought to bind to sodium cell wall pumps. It remains in the body for a long time. It gives symptoms similar to chronic fatigue syndrome You may see an extensive discussion [of this toxin along with a proposal of a vitamin B-12 antidote here](#). It is said that vitamin B-12 should not be supplemented without folate and the reverse. Mannitol has been proposed as a treatment [Karlin]. Since fish migrate and in addition are transported all over the world, eating oceanic fish (especially large reef fish) or pigs or chickens (it is said that chickens receive only 2% fishmeal) fed such fish may not be worth (Tyson Inc. claims no use of fish) the risk even for healthy people. I suspect that cod-liver oil is safe since it is a northern fish. A recurrence of neurological symptoms may be brought on by consumption of alcohol (probably not the alcohol itself, but poisons associated with it) or certain foods such as other fish, fish-flavored food products, meat such as chicken and pork , and peanut butter or nut oils.

It is also said to be important to receive at least a small amount of meat or dairy products at every meal since these are quality proteins. Many nutritionists believe that you should eat more than the 50 grams of protein in a 2000 Calorie diet, which the US government recommends, as much as double that amount or more. [from a dead URL]. I can not help with advice on this for sure, but I suspect the governments recommendation is a minimum. Much of the usefulness of quality protein (protein high in lysine and methionine amino acids) is said to be lost if it is eaten even as little as two hours after the main meal [I have lost the reference]. Lysine can have some additional importance because arginine amino acid accentuates the symptoms of an attack of the herpes type of virus [McCune] (such as chicken pox, shingles, infectious mononucleosis, roseola). Thus an attack of [shingles, which disease is a resurgence of chicken pox virus from the pain nerves near the spine where they have been dormant](#), will be accentuated and perhaps even triggered by foods high in arginine. These foods are said to include peanuts (peanuts are 50% higher than cashews, but which last are substantial nevertheless), other nuts and non grass seeds, and chocolate ([see here for a table which gives lysine and arginine values](#) by weight of food and lysine\arginine ratios). [Lysine helps to mute the effects of the virus](#), significantly reducing the occurrence (when taken routinely during the disease), severity, and healing time of herpes simplex

virus [Griffith]. You can recognize shingles by large patches of a painful rash which appears on one side of the body in people under emotional stress [Irwin], older people, or people whose immune system has been compromised. It is said that injections of adenosine monophosphate and interferon gamma will also help heal herpes infections [Nikkels].

Since whatever long lasting infection (70 to 80 % retrovirus signs [DeFreitas] ) or/and poison [Bell 1998] [Racciati] or/and small adrenal glands [Scott & Dinan] or/and disruption of the brain-pituitary axis [Scott & Svec & Dinan] (but beyond any reasonable doubt not hypochondria or mass hysteria from reading newspapers) is causing chronic fatigue syndrome ([CFS, postinfectious neuromyasthenia, chronic virus infection, myalgic encephalomyelitis, chronic fatigue immune dysfunction syndrome, CFIDS, fibromyalgia, FM, ME, PVFS](#)) seems to make people more susceptible to herpes virus with 77% of CFS patients containing antibodies to HHV-6 EA as IgM and IgG [Patnaik] it may be prudent for these CFS people also to eat sparingly of high arginine foods continuously after CFS or maybe until tests determine that the immune peptide hormones [Patarca] are all normal again. The symptoms of chronic fatigue syndrome are impaired sleep, loss of memory, sore throat, muscle and joint aches, headache, cough, photophobia, extreme long lasting fatigue after physical exertion, night sweats, [Evengard] depression that has much lower ACTH and cortisol secretion than other types of depression [Demitrack], lymph node pain, eye pain and fibromyalgia (muscle pain) [Bell 1994] as well as white spots on MRI brain scans and sometimes loss of fingerprints, a chronic low level activation of the immune system [Cannon] which last may be accounting for many of the symptoms, but all symptoms highly variable, possibly because the part of the brain attacked varies or because there are different varieties of virus or both. Whole body potassium in CFS averages a little lower than other healthy people which themselves are low in potassium in our society. The CFS average was two thirds of the highest values of "normal" people [Burnett]. The affect of potassium would bear investigation. When it is, magnesium should be part of the experiment since there was significant improvement of a patient from magnesium injections [Takahasha]. Potassium should be used with caution and under a doctor's care since when a patient thought to be exhibiting symptoms of fibromyalgia was brought to 5.0 mEq/l of potassium in her blood (which is about normal), she contracted paralysis [Gotze]. This may be because experiments have shown that people who have CFS with muscle pain have normal extra cellular potassium and so [fibromyalgia](#) must be a different subset of CFS or caused by a different virus species. In monkeys the electrocardiogram in magnesium deficiency resembles that of high serum potassium (hyperkalemia) in spite of low serum potassium (hypokalemia) [Manitius p39]. So it is possible that lower cell potassium requires lower serum potassium for normal nerve transmission, but the serum potassium does not drop [Manitius p38]. During a magnesium deficiency cellular muscle potassium drops but not liver potassium [Petersen] and a [large potassium intake does not prevent this \(scroll down\)](#) [Manitius]. Grace and O'Dell are of the opinion that this disturbance of potassium metabolism is due to the dependence of the sodium pump on ATPase which in turn depends on the magnesium [Grace], possibly by virtue of a calcium inactivation of the enzymes [Heggtveit]. If a magnesium deficiency does develop, half a year of supplements can be required for complete normalization of magnesium and potassium - sodium pumps [Anonymous] A high potassium intake in sheep [Newton], large amounts of vitamin D, and wheat phytic acid increase magnesium need although calcium has little affect at 10 mg of magnesium per kilogram of body weight [Seelig]. Seelig recommends 7-10 mg of magnesium per kilogram of body weight. ([See this](#)

[site for FAQ and links about CFS](#)) and this site [far some possible strategies for CFS and fibromyalgia](#). This site shows [how to increase magnesium in the diet](#). Magnesium is probably one of the most widespread deficiencies in our society (USA).

Potassium has a wider margin of error in timing when eaten than the above two amino acids may have, but you should avoid any deficiency or starvation which lasts more than 2 or 3 days if at all possible when you are replete in order to remain in top notch shape, and you should make a considerable effort to avoid any deficiency in food at all when you have a deficiency in potassium or have arthritis. There is an excellent article [on practical ways to get more potassium from food](#). It is possible that eating smaller amounts at five or more meals each day would enable you to retain a larger fraction of the total potassium since surges would be avoided. [There seem to be advantages with weight control and other problems from such a procedure](#).

## OTHER NUTRIENTS

Of course, even when you are receiving a "balanced diet" (as defined by the food pyramid), you should still give some reasonable attention to each of the other essential nutrients. Magnesium is directly related since the body can not absorb potassium easily during a magnesium deficiency. Magnesium supplements can take up to six months to normalize the magnesium, potassium, and sodium pumps. It may not happen at all if vitamin D is deficient since the kidneys depend on vitamin D to reabsorb magnesium [Ritchie]. Krispin Sullivan, clinical dietitian, [has written an excellent article on magnesium deficiency](#). Agar seaweed is a very rich source of magnesium since a hundred grams dry weight contains 770 milligrams. It is also very rich in copper. It does not pay to go overboard on anything and it is possible that huge amounts of it could cause iodide toxicity, although I have no evidence. Magnesium appears to be especially important when suffering from [chronic fatigue syndrome, fibromyalgia, or some asthmas](#). Also see [a proposal to increase magnesium in drinking water for heart disease, asthma, migraine headaches](#), depression, etc. Magnesium activates some of the dozen or so electrolyte pumps, is said to inhibit the potassium chloride cotransport pump, blocks some pumps, and is said to increase the potassium pore permeability [Bara]. To imagine that the housewife (or house husband if he prepares the food) can get on top of all that in addition to bizarre large additions of nutrients such as chloride and phosphate placed there by the criminally incompetent junk food processors on her way out to the food store and adjust the food destruction with pills is dream like. The top researchers and dietitians of the world can not. So her only real chance is to acquire a wide array of unprocessed food and hope her family has no serious genetic defects. Medications are not a satisfactory substitute for food, indeed are usually harmful. The following is a statement in a long term research into effect of arthritis medicines; "It was in 1988 that Pincus suggested that short-term studies may give rise to false expectations, and that radiological and laboratory values are overemphasized at the expense of long-term outcomes of functional status and death," Dr. Gibson and colleagues comment. "Perhaps our study serves to reinforce this message." [Gibson]

Extra [copper](#) may be necessary when recovering from arthritis. It is reasonable to suspect that healing

would be more effective if all the other nourishment is adequate. Arthritics are deficient in pyridoxine, zinc, and magnesium versus the recommended daily allowance and copper and folate versus the typical American diet [Kremer 1997] (which itself is not sensational). They also have inadequate calcium, vitamin E and selenium [Stone]. Brazil nuts are rich in selenium. You should pay particular attention to vitamin A on a series of bright sunny days, vitamin B-1 if you eat foods made with sulfur dioxide (which destroys B-1 in the intestines [Fitzhugh][Amerine p487] ) such as wine, vinegar, and some dried fruit and a [vitamin B-1 deficiency](#) is especially dangerous to the heart and kidneys when potassium is becomes replete [Folis] (wine can be obtained without the sulfur dioxide and is [said to be advantageous as part of the so called “Mediterranean diet”](#), probably because of a poison that inhibits potassium excretion), vitamin C if you have been cooking most of your food or have been eating stale food or [have a viral infection](#), possibly [vitamin E to protect the heart](#), maybe [linoleic \(omega 6\)](#) and [linolenic \(omega-3 fatty\) acid](#) if you have been eating hydrogenated foods, ([which is definitely not recommended](#)). The ratio of [omega 6 to omega 3 oils should be one](#), but modern diets are much higher [Simopoulos]. However it is probably not a good idea to add excessive amounts of these oils to your diet because they have been [associated with breast cancer](#) and omega 6 could possibly inhibit the immune system [Grimm 2002], although white cell (T and B cells) functions are apparently not affected [Kelley]. so perhaps neither one should be supplemented to overwhelming excess. [However, supplements may be in order if you are afflicted with depression, since a negative correlation has been established.](#) You may see a [graph showing ratios of these essential oils in some foods here](#). Fish oils are high in omega 3 as is flax seed, which is said to mute arthritis symptoms. A compound related to omega 3 and omega 6 oils is cetyl meristoleate and is said to improve arthritis [Kremer 2000] but I know of no supportive theory other than that prostaglandin hormones may be increased and dampen immunity in some way. You may see a [site which rates its effectiveness here.](#) ). You should give some thought to calcium if you have been subject to cramps, spasms (spasms are more likely on a high potassium intake in the absence of calcium), probably tuberculosis [Wilkinson], or [tooth decay](#). [Vitamin D](#) is necessary in conjunction with the calcium and is probably important for magnesium absorption also. Equally important is to keep the teeth sound with adequate intakes of calcium, phosphate, magnesium, and vitamin D. The last is especially important for people who must be inside away from sunlight. Vieth argues that the 200 international units (IU) RDR (or RDA) is too low. He maintains that 200 IU merely prevents osteoporosis after a fashion. He recommends 800 to 1,000 IU total per day. Apparently he claims that epidemiological studies and circumstantial evidence show lower rates of multiple sclerosis, hypertension, osteoarthritis, and colorectal, prostate, breast, and ovarian cancer from increased vitamin D. Since naked Africans receive 10,000 IU, he suggests that concerns of toxicity are inappropriate [Vieth]. However, It has been proposed that [vitamin D accentuates the symptoms of sarcoidosis \(thought to be a bacterial infection\)](#), and supplements or sunlight probably should not be used then. For complete safety iodide must be supplemented in the absence of seafood and table salt. Vitamin B-6 (pyridoxine) deficiency has been found to increase tumor necrosis factor (TNF) in arthritis [Roubenoff]. TNF stimulates parts of the immune system which have to do with inflammation, among other things. There is a suspicion that vitamin B-6 can permit reabsorption of rheumatoid nodules [McCarty]. Vitamins B-6, B-1, and B-12 were found by Vetter et al to lower pain somewhat more when combined with a painkiller [Vetter].

[Vitamin B-3 \(niacinamide\) has been used as far back as earlier than 1955 to mute the symptoms of arthritis.](#) It is conceivable that a metabolite of this vitamin helps power the potassium pumps.

## FRUIT

Fruits are not a good source of nourishment. They generally contribute little besides vitamin C and potassium as you can verify by looking at the [USDA Handbook #8](#) from the US Govt. Printing Office, and are [not even sensational in these](#) as a rule. The plants which have formed the fruits have endowed them with lovely attractive color pigments, seductive aromas, and titillating flavors. These attractants are a snare and a delusion designed to persuade animals to eat them and then scatter the bitter, hard, even poisonous seeds far and wide. They tend to be high in sugars such as fructose and sucrose, which are attractive to our sweet tooth but which interfere with copper absorption. When it comes to anything with nutritional value, the plant puts as little in as possible and still form the fruit since vitamins and minerals are tasteless. The only exceptions are vitamin C and potassium with which they are moderately endowed (although acerola berries, jujube dates {Chinese dates}, tropical guava, and kiwi fruit are outstandingly high in C). [See this site for a discussion of fruit.](#) The usefulness that I see for fruit is as a clever technique for making less palatable food more attractive, such as raisins for bran or carrots, apples for salad, or apple juice for oatmeal for instance.

A wide spread fallacy is that bananas are a rich source of potassium. As you can clearly see from the table, they are only a moderate source, about the same as potatoes. I have a feeling this is a classic case of the success plants have had in fooling the primates or possibly also the success of advertising campaigns. Today there are monolithic stands of banana trees as far as the eye can see probably because of banana oils (but no doubt with considerable assistance from fruit company ads). Even so, bananas are a 3 or 4 times better source of calories than most whole grain, for arthritics at least.

Somewhere I have seen a hypothesis that plants containing [pectins such as apples cause a favorable intestinal flora to grow](#) and so may be worth eating for that reason. Also an experiment has disclosed that copper is absorbed enough more efficiently if apples are eaten with the meal to cause a considerable net increase of copper absorbed, much more than enough to compensate for the apple's lower copper content [Sable-Amplis]. This could be the reason that apples seem to lower cholesterol. I have heard that cherries have a favorable affect on arthritis [Blau]. It could be that they have a poison which retards potassium excretion or that they have an acid which is absorbed but which can not be metabolized. If interference with potassium is the mechanism, it is likely that increasing potassium would be a superior strategy than use of cherries. [A recent study gives kiwi fruit a high nutritional rating, including magnesium and potassium.](#) However, in any case, I will stay with my contention that fruits in general are of marginal value until someone comes up with crisp evidence to the contrary. We tend to put considerable weight on instincts and emotional feelings of pleasure when evaluating food, so that fruit will continue to be eaten in large amounts regardless of what I say, and people in good health should be able to do so with little problem. However you should be aware of fruit's true nutritional content. In fact you should be aware of the true nutritional value of all the food which you eat, almost as much aware as

you are aware of the quality of oil that you put in your car.

## IDEAL POTASSIUM INTAKE

If every one had an average intake of potassium equal to his fair share of the as grown potassium, they would receive about 3,500 milligrams per day [Economic Research Service]. After processing losses and uneaten food is subtracted from the total [Adelson], my best guess is that the average daily intake is about 2,000 milligrams per day. Keep in mind that half the people are eating less than the average. Old people have an intake less than the average [Dall & Gardner]. [Dall, et al], which is no doubt at least partly due to a lower caloric intake. Black people in Georgia average 1,500 milligrams per day, while their white neighbors average 2,000 milligrams [Grim 1970,1980]. I say the above is an unacceptably high loss. Anyone taking a pay cut like that would be very, very unhappy.

[Low potassium intake is also somewhat implicated in high blood pressure, stroke \[Khaw\], osteoporosis., and kidney stones.](#) Potassium has been endorsed for [use against stroke and high blood pressure by the FDA](#), although potassium ingested as the chloride can actually raise blood pressure (hypertension). [See this site for other natural ways of lowering blood pressure](#), and this one for [some proposed causes of hypertension](#).

The health [of people in the USA is abysmal \(numerous statistics\)](#), and a major part of it is poor nutrition. As the 12th century physician, trying to cure by diet before he administers drugs, said; "No illness that can be treated by diet should be treated by any other means" or as Hippocrates expressed it in 460 - 377BC; "If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health." It would seem that a healthy life style has been known for a long time. It is my belief that an unprocessed, unfrozen, not canned, high in vegetables diet would keep a large majority of people reasonably healthy and without the need for fad diets. 80% of Americans do not eat adequate vegetables, but even though 72% of Americans take vitamin or mineral supplements daily or sometimes [Sardi p148], their health is atrocious, [especially old people](#).

Continue to [Chapter X, PROCESSING LOSSES](#)

and [LOSSES IN THE KITCHEN](#)

[Back to Chapter I, ARTHRITIS INTRODUCTION.](#)

## EPILOGUE

[You may see the search section of a site which explores nutritional solutions by using existing research and logical thinking to explore possible environmental, especially nutritional, links in a variety of](#)

[inherited connective tissue disorders \(Marfan syndrome, Ehlers-Danlos syndrome, osteogenesis imperfecta, etc.\) and related features such as scoliosis, pectus excavatum, mitral valve prolapse and TMJ.](#)

There is an article [discussing cashew nuts to cure a tooth abscess Which might prove useful](#)

There is also [an article which proposes some speculation about diabetes.](#)

For a procedure that discusses [tetrathiomolybdate for removing copper and thus preventing further solid cancer growth and Hodgkin's, see this site.](#) This might buy some time until you can persuade a doctor to try tumor necrosis factor or interferon.

See this site for evidence [of a correlation between magnesium deficiency and cancer.](#)

A site is available which shows. [foods which are high in one nutrient and low in another \(including calories\).](#) This last site should be especially useful for a quick list of foods to consider first, or for those who must restrict another nutrient because of a genetic difficulty with absorption or utilization p>You may find useful for definitions and easy to use [a search for abstracts of journal references, "Gateway".](#) [For those which have abstracts available, click on "expand" or for definitions click on "find terms".](#) and also you can [search in a similar way here](#) or a list of medical [search engines](#) and also [a site with several links to potassium nutrition articles](#) and another site that [has many links to nutrition sites around the world.](#) There is a site which [rates nutritional supplements for arthritis \(but not potassium\).](#)

There are numerous links to a site which [has numerous links to arthritis.](#) There is a site with [numerous links to arthritis amelioration, which stress a healthy life style.](#)>

If you use medication, you may see technical evaluations and cautions of drugs at the bottom of [this site.](#)

The very extensive USDA Handbook #8 may be seen [here.](#) [To access the information you must press "enter" to search, and then divide Kcal into milligrams of potassium.](#) This last table is very comprehensive, is used in search mode, and even lists the amino acids.

[Google is a large, general search engine which lists the most informative articles first.](#) Google has a free program which enables you [to put a tool bar on your screen which at the click of a button enables you to perform a search of the web right from the window you are viewing or the article itself, determine its rank, find anyone linking to it, find similar articles, translate it into English, and bring up its lead articles.](#) It also will mark any word in the article you wish and search within the article. It is something else.

[There is a free program available which tells on your site what web site accessed you, which search engine, statistics about which country, statistics of search engine access, keywords used and their frequency.](#) It can be very useful.

The author has a degree in chemistry and a master of science degree in soil science. He has researched

this subject for 40 years, primarily library research. He has cured his own early onset of arthritis. He has published articles on allied subjects in; The Journal of Theoretical Biology (1970, 1983), The Journal of Applied Nutrition (1974) which gained the best article of the year award, Clinical and Experimental Rheumatology (1983), and Medical Hypotheses (1984, 1999) This article is solely funded by the author.

Send email to Charles Weber; ----- isoptera at mchsi.com – or; phone = 828 692 5816

Confidentiality of data relating to individual patients and visitors to a medical/health Web site, including their identity, is respected by this Web site. The Web site owner undertakes to honor or exceed the legal requirements of medical/health information privacy that apply in the USA. While it is not the policy of this author to use testimonials, you may, if you wish, tell of the outcome of health strategies to [a site which archives such experiences.](#)

All printed rights to this article are reserved.

There are also the following medical sites which are pretty good (but none of which are especially useful for arthritis or potassium):

- [1. HON](#)
- [2. National Institute of Health](#)
- [3. Medscape](#)
- [4. WebMD](#)
- [5. DrKoop](#)
- [6. med411.com](#)
- [7. British Medical Journal](#)
- [8. Intelihealth](#)
- [9. Mayo Health System](#)
- [10. Center for Disease Control](#)
- [11. Breaking medical news](#)

## REFERENCES

Adelson SF et al 1963 Discard of edible food in households. Journal Home Economics 55; 633.

Allard J, Lennon DP, Greenwood MR, Buckenham AJ, Hawthorne JN. 1993 Reduced sodium pump activity in inositol-deficient HL-60 cells: no evidence of control by protein kinase C. Biochim Biophys Acta. Dec 16;1220(1):66-8.

Amerine MA Ough CS 1972 Recent advances in enology. CRC Critical Reviews in Food Technology V2 issue 4407-526.

Anonymous 1994 Potassium and sodium and potassium in the skeletal muscle. *Laeger Ugeskr* 156; 4007- 4010.

Bajusz E, ed 1966 *Electrolyte and Cardiovascular Diseases: Physiology, Parthology, Therapy*, vol. 2 The Williams & Wilkins Co., Baltimore.

Bara M, Guet-Bara A, Durlack J 1993 regulation of sodium and potassium pathways by magnesium in cell membranes. *Magnesium Research* 6; 167-177.

Bajusz (I have misplaced this reference).

Bell DS, Bell KM, Cheney PR 1994 Primary juvenile fibromyalgia syndrome and chronic fatigue syndrome in adolescents. *Clin. Infect Dis.* Jan, 18 Suppl 1; 521-523.

Bell IR, Baldwin CM, Schwartz GE 1998 Illness from low levels of environmental chemicals: relevance to chronic fatigue syndrome and fibromyalgia. *Am. J. Med.* 105; 74s-82s.

J, Cui J, McDonald TV 2001 HERG K(+) channel activity is regulated by changes in phosphatidyl inositol 4,5- Bian bisphosphate. *Circ Res.* 89(12): 1168-76.

Blau, LW 1950 Cherry diet control for gout and arthritis-Texas reports on biology and medicine, 8, in; Rodale JI & Adams R 1961 *The Complete book of Food and Nutrition*. Rodale Press, Emmaus, Penn. US.

Blundell JE, Green S. & Barley VJ 1994 Carbohydrates and human appetite. *American Journal of Clinical Nutrition* 59 (suppl) ; 728 s-734 s.

Brown J, Bourke GJ, Gearty CF, Finnegan A, Hill M, Hefferman-Fox FC, Fitzgerald DE, Kennedy J, Childers RW, Bishop WJE, Trulson MF, Latham MC, Gronin S, McCann WB, Clancy RE, Gore I, Stoudt HW, Hegsted DM, Stare FJ 1970 Nutritional and epidemiological factors related to heart disease. *World Rev. Nutr. Diet* 32.

Burnett RB, Yeap BB, Chatterton BE, Gaffney RD 1996 Chronic fatigue syndrome: is total body potassium important? *Med. J. Aust.* 164; 384.

Cannon JG, Angel JB, Abad LW, Vannier E, Mileno MD, Fagioli L, Wolff SM, Koaroff AL 1997 Interleukin - 1 beta, interleukin - 1 receptor antagonist, and soluble interleukin - 1 receptor type II secretion in chronic fatigue syndrome. *J. Clin. Immunol.* 17; 253-261.

Cowin IS, Emmett PM, and the ALSPAC Study Team 2001 Associations Between Dietary Intakes and Blood Cholesterol Concentrations at 31 Months *European Journal of Clinical Nutrition.* 2001;55:39-49.

- Dahl LK 1960 Results of chronic excess salt feeding. *Journal of Experimental Medicine* 112; 635-651.
- Dall & Gardner HS 1971 Dietary intake of potassium by geriatric patients. *Gerontol. Clinic* 13; 119-124.
- Dall JLC Paulose S & Ferguson JA 1971 Potassium intake of elderly patients in hospital. *Gerontol. Clinic* 13; 114.
- DeFreitas E, Hilliard B, Cheney PR Bell DS Kiggunde E Sankey D Wroblewska Z Palladino M Woodward JP Koprowski H 1991 Retroviral sequences related to human T-lymphotropic virus type II in patients with chronic fatigue immune dysfunction syndrome. *Proc. Natl. Acad. Sci* 88; 2922-2926.
- Demitrack MA, Dale JK, Straus SE, Laue L, Listwak SJ, Kruesi MJ, Chrousos GP, Gold PW 1991 Evidence for impaired activation of the hypothalamic-pituitary-adrenal axis in patients with chronic fatigue syndrome. *J Clin Endocrinol Metab.* Dec;73(6):1224-34.
- Doyle R 2002 Down on the farm. *Scientific American* 287 No2; 27.
- Economic Research Service 1971 Food consumption supplement for 1970 to Agricultural Economic Report #138 USDA, Wash. DC
- Evengard B Schacterle RS Komaroff 1999 Chronic fatigue syndrome: new insights and old ignorance. *J. Intern. Med.* 246; 455-469.
- Fitzhugh DG Knudsen L Nelson A 1946 The chronic toxicity of sulfites *J. Pharm. Exptl. Therap.* 86; 37-48.
- Flink EB 1983 Nutritional aspects of potassium metabolism p37-44. in; Whang R Aikawa JK eds. *Potassium its Biologic Significance.* CRC Press, Boca Raton, Fla.
- Folis RH 1942 Myocardial necrosis in rats on a potassium low diet prevented by thiamin deficiency. *Bull. Johns-Hopkins Hospital.* 71; 235-241.
- Gibson T et al 2001 *J Rheumatol* ;28:2409-2415.
- Gotze FR Thid SK Kyllerman M 1998 Fibromyalgia in hyperkalemia periodic paralysis. *Scand. Journal Grace ND O'Dell BL 1970 Effect of magnesium deficiency on the distribution of water and cations in the muscle of the guinea pig. J. Nutr.* 100; 45-50.
- ? *Rheumatol.* 27; 383-384.
- Griffith RS, DeLong DC, Nelson JD 1981 Relation of arginine-lysine antagonism to herpes simplex

growth in tissue culture. *Chemotherapy* ;27(3):209-13.

Griffith RS, Walsh DE, Myrmel KH, Thompson RW, Behforooz A 1987 Success of L-lysine therapy in frequently recurrent herpes simplex infection. Treatment and prophylaxis. *Dermatologica* ;175(4):183-90.

Grim CE et al 1970 On the higher blood pressure of blacks: A study of sodium and potassium intake and excretion in a bi-racial community. *Clinical Research* 18; 593.

Grim CE, Luft FC, Miller JZ, Meneely GR, Battarbee HD, Hames CG, Dahl LK 1980 Racial differences in blood pressure in Evans County, Georgia: relationship to sodium and potassium intake and plasma renin activity. *J Chronic Dis.* 33(2):87-94.

Grimm H, Mayer K, Mayser P, Eigenbrodt E. 2002 Regulatory potential of n-3 fatty acids in immunological and inflammatory processes. *Br J Nutr.* 2002 Jan;87 Suppl 1:S59-67.

Goodwin JS Goodwin JM 1984 The tomato effect, rejection of highly efficacious therapies. *JAMA* 251; 2387-2390.

Hadhazy VA Ezzo J Creamer P Berman BM 2000 Mind - body therapies for the treatment of fibromyalgia, a systematic review. *Journal Rheumatol.* 27;2911-2918.

Hanninen O, Rauma AL, Kaartinen K, Nenonen M. 1999 Vegan diet in physiological health promotion. *Acta Physiol Hung.* 86(3-4):171-80.

Heggveit HA 1965 The cardiomyopathy of magnesium deficiency. in; *Electrolytes and Cardiovascular Diseases*, Bajusz E, ed. S. Karger, Basel & NY.

Hu FB Stampfer MI Rimm EB Manson JE Aschiro A Colditz GA Rosner BA Spiegelman D Speizer FE Sacks FM Hennekens CH Willett WC 1999 A prospective study of egg consumption and risk of cardiovascular disease in men and women. *JAMA* 281 (15); 1387-1394.

Irwin M, Costlow C, Williams H, Artin KH, Chan CY, Stinson DL, Levin MJ, Hayward AR, Oxman MN: Cellular immunity to varicella-zoster virus in patients with major depression *J Infect Dis* 1998 Nov;178 Suppl 1:S104-8.

Ivie GW Holt DL Ivey MG 1981 Natural toxicants in human foods: psoralans in raw and cooked parsnip root. *Science* 213 No. 4510 ; 909-910.

Jentoft ES Kvalik AG Mengshoel AM 2001 Effects of pool - based and land based aerobic exercise on women with fibromyalgia / chronic widespread pain. *Arthritis Rheum.* 45; 42-47.

Johnson H 1995 Osler's Web Penguin Books.

Johnson S 2001 the multifaceted and widespread pathology of magnesium deficiency. *Medical Hypotheses* 56; 163-170.

Kelley DS. 2001 Modulation of human immune and inflammatory responses by dietary fatty acids. *Nutrition*. Jul-Aug;17(7-8):669-73.

Khaw KT, Barrett-Connor E 1987 Dietary potassium and stroke-associated mortality. A 12-year prospective population study. *N Engl J Med*. Jan 29;316(5):235-40.

Khetagurova ZV 1982 Function of the hypothalamic-hypophyseal-adrenal system in patients with rheumatoid arthritis. *Terapevticheskii Archiv* 54; 92-95. (Russian).

Kremer JM Bigouette J 1996 Nutrient intake of patients with rheumatoid arthritis is deficient in pyridoxine, zinc, copper, and magnesium. *Journal of Rheumatology* 23; 990-994.

Kremer JM. 2000 n-3 fatty acid supplements in rheumatoid arthritis. *Am J Clin Nutr*. 2000 Jan;71(1 Suppl):349S-51S.

LaCelle PL et al 1964 An investigation of total body potassium in patients with rheumatoid arthritis. *Proceedings of the Annual Meeting of the American Rheumatism Association, Arthritis and Rheumatism* 7; 321

LaVecchia c Decarli A Pagano R 1998 Vegetable consumption and risk of chronic disease. *Epidemiology* 9; 208-210.

Linos A et al. Dietary factors in relation to rheumatoid arthritis: a role for olive oil and cooked vegetables? *Am J Clin Nutr* 1999; 70: 1077-82.

Mann GV 1977 Diet-Heart: end of an era. *New England Journal of Medicine* 297; 644-650.

McCarty DJ. 1991 Complete reversal of rheumatoid nodulosis. *J Rheumatol*. May;18(5):736-7.

McCune MA, Perry HO, Muller SA, O'Fallon WM 1984 Treatment of recurrent herpes simplex infections with L-lysine monohydrochloride. *Cutis* Oct;34(4):366-73.

Newton GL Fontenot JP Tucker RE Polan CE 1972 Effects of high dietary potassium intake on the metabolism of magnesium by sheep. *J. Anim. Sci.* 35; 440-445.

Nikkels AF, Pierard GE.1994 Recognition and treatment of shingles. *Drugs*. Oct;48(4):528-48.

- Odabas AR Cetinkaya R Selcuk Y Kaya H 2001 Severe athralgia and myalgia due to high-dose methylprednisolone pulse therapy cured by potassium infusion in a patient with diffuse proliferative lupus nephritis. *Nephron* 87; 95.
- Oliver WJ Cohen EL Neel JV 1975 Blood pressure, sodium intake, and sodium related hormones in the Yanomamo Indians "no salt culture". *Circulation* 52;146151.
- Patarca R Klimas NG Lugtendorf S Antoni M Fletcher MA 1994 Dysregulated expression of tumor necrosis factor in chronic fatigue syndrome interrelations with cellular sources and patterns of soluble immune mediator expression. *Clin Infect. Dis.* Jan 18 Suppl. 1; s147-s153.
- Patnaik M Komaroff AL Conley E Ojo-Amaize EA Peter JB 1995 Prevalence of IgM antibodies to human Herpes virus 6 early antigen (p31/48) in patients with chronic fatigue syndrome. *J. Infect. Dis.* 172; 1364- 1367.
- Pattison, D. 2004 *Arthritis & Rheumatism*, Vol 50: pp 3804-3812.
- Petersen Posborg V 1972 Potassium and magnesium turnover in magnesium deficiency *Acta Med. Scand.* 174; 595-604.
- Racciati D Vechiet J Ceccomancini A Ricci F Pizzigallo E 2001 Chronic fatigue syndrome following toxic exposure. *Sci. Total Environ.* 270; 27-31.
- Rauma A-L Tormalia M-L Nenonen M Hanninen o 1994 Iodine status in vegans consuming a living food diet. *Nutr. Res.* 14; 1789-1795.
- Rauma A-L Torronen R Hanninen O Mykkanen H 1995 ViaminB-12 status of long term adherents of a strict uncooked vegan diet ("living food") diet is compromised. *Journal of Nutrition* 125;2511-2515. Comments by Davis DR et al in the 1997 issue, start p378.
- Ritchie G, Kerstan D, Dai LJ, Kang HS, Canaff L, Hendy GN, Quamme GA 2001 1,25(OH)(2)D(3) stimulates Mg<sup>2+</sup> uptake into MDCT cells: modulation by extracellular Ca<sup>2+</sup> and Mg<sup>2+</sup>. *Am J Physiol Renal Physiol.* 2001 May;280(5):F868-78.
- Roubenoff R, Roubenoff RA, Selhub J, Nadeau MR, Cannon JG, Freeman LM, Dinarello CA, Rosenberg IH. 1995 Abnormal vitamin B6 status in rheumatoid cachexia. Association with spontaneous tumor necrosis factor alpha production and markers of inflammation 1995 *Arthritis Rheum.* Jan;38 (1):105-9.
- Ryan MP Whang R 1983 Interrelationships between potassium and magnesium. In; *Potassium: Its Biologic Significance.* CRC Press, Boca Raton, FL.

- Sable-Amplis R Sicart R Reymir B 1987 Apparent retention of copper, zinc, iron in hamsters, influence of a fruit enriched diet. *Nutrition Reports International* 35; 811-818.
- Saltin B Astrand P-O 1993 Free fatty acids and exercise. *American Journal of Clinical Nutrition* 57 (suppl) 752 s-758 s.
- Sardi B 2003 *The New Truth About Vitamins and Minerals*. Here and Now Books, 457 West Allen Ave. #117, San Dimas, CA 91773.
- Scott LV Dinan TG 1999 Small adrenal glands in chronic fatigue syndrome: a preliminary computer tomograph study *Psychoneuroendocrinology* 24; 759-768.
- Scott LV Svec F Dinan T 2000 A preliminary study of dehydroepiandrosterone response to low dose ACTH in chronic fatigue syndrome and in healthy subjects. *Psychiatry Research* 97; 21-23.
- Seelig MS 1964 The requirement of magnesium by the normal adult. *American Journal of Clinical Nutrition* 14; 342-390
- Simopoulos AP. 2002 The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomed Pharmacother.* 2002 Oct;56(8):365-79.
- Skoldstam L, Hagfors L, Johansson G. 2003 An experimental study of a Mediterranean diet intervention for patients with rheumatoid arthritis. *Ann Rheum Dis.* 2003 Mar;62(3):208-14.
- Slater G, et. al., *Nutrition Reports International*, vol. 14 (1976), page 249.
- Stebens WE 2004 Hypothetical hypercholesterolemia and atherosclerosis. *Medical Hypotheses* 62; 72-78.
- Stone J Doube A Dudson D Wallace J 1997 Inadequate calcium, folic acid, vitamin E, zinc, and selenium intake in rheumatoid arthritis patients: results of a dietary survey. *Seminars in Arthritis and Rheum.* 27; 180-185.
- Takahashi H Imai K Katanuma A Sugaya T Hisano K Motoya S Aoki S Sugiyama T Yachi A 1992 A case of chronic fatigue syndrome who showed a beneficial effect by intravenous administration of magnesium sulfate. *Arerugi* 41; 1605-1610.
- Trujillo E, Alvarez de la Rosa D, Mobasher A, Gonzalez T, Canessa CM, Martin-Vasallo P. *Histol Histopathol.* 1999 Oct;14(4):1023-31.
- Vetter G, Brüggemann G, Lettko M, Schwieger G, Asbach H, Biermann W, Bläsius K, Brinkmann R,

Bruns H, Dorn E. 1988 Shortening diclofenac therapy by B vitamins. Results of a randomized double-blind study, diclofenac 50 mg versus diclofenac 50 mg plus B vitamins, in painful spinal diseases with degenerative changes] Z Rheumatol. 1988 Sep-Oct;47(5):351-62. (Article in German ).

Van Duyn MA Pivonka E 2000 verview of the health benefits of fruit and vegetable consumption for the dietetics professional: selected literature. J Am Diet Assoc. Dec;100(12):1511-21.

Vieth R 1999 Vitamin D supplementation, 25-hydroxyvitamin D concentrations and safety. American Journal of Clinical Nutrition 69; 842-856.

Weber CE 1974 Potassium in the etiology of rheumatoid arthritis and heart infarction. Journal of Applied Nutrition 26; Nos 1&2, 41-67.(bibliography must be acquired separately).

Westerterp KR 1993 Food quotient, respiratory quotient, and energy balance. American Journal of Clinical Nutrition 57(suppl); 759 s-765 s.

Wilkinson RJ Llewelyn M Toosi Z et al 2000 Influence of vitamin D deficiency and vitamin D receptor polymorphisms on tuberculosis among Gyarati Asians in West London: a case controlled study. Lancet 355; 618-621.

Email to Charles Weber = isoptera at mchsi.com --or -- 828 692 5816

This page has been visited **a lot of** times

This article has been modified in December, 2004.

