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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

A few months ago, we talked about the benefits of algae, from a fertilizer, a bio-stimulant to a food source. A recent study published in the Journal Progress in Cardiovascular Disease in February 2020 found that “the algae called 'spirulina' has the ability to boost our bodies type 1 interferon response to fighting RNA viral infections such as influenza and the coronavirus”.

Other nutraceuticals such as sulforaphane from cruciferous vegetables and elderberries have been found to be beneficial in fighting viruses like influenza and the common cold.

From Issue #109 where we discussed Elderberries as a super food: “Modern researchers have found that some of the phytochemicals found in the fruit make it harder for viruses and bacteria to reproduce. The berries (actually drupes for those whom want to be picky) also contain health promoting chemicals called flavonoids, more than any other berry. They also have the highest antioxidant properties of any of the berries. Additionally, they are higher in minerals and other nutrients than other berries. Several doctors in recent news interviews have recommended elderberries to help strengthen one’s immune system and help protect against viruses”.

Several studies have shown that eating fermented members of the cabbage family like sauerkraut and bok choy slows the development of viruses.



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A few years ago, in our study of all the elements in the human body, we found that a lack of selenium (Se) allows viruses to replicate more quickly. We also found that zinc (Zn) lozenges have been proven to support the immune function of our cells that reduce the symptoms of viruses and greatly speed recovery from colds and flu by 300%.

With all the hype on the corona virus we are reprinting the information on selenium. This has been updated with new material that has come out in the literature since we first published the information a few years ago.

MINERALS - The Elements and What They Do

Part 26

34) Selenium (Se) - In general selenium is found in igneous rocks at 0.05 ppm, shale at 0.6 ppm, sandstone and limestone at 0.05-0.08 ppm, fresh water at 0.02 ppm, sea water at 0.00009 ppm, and soils at 0.2 ppm. However, selenium is not evenly distributed hence much higher levels can occur in some areas while some areas of the earth have none.

Marine plants can have 0.8 ppm, land plants can have 0.2 ppm, and land animals at 1.7 ppm. Selenium has an electrical oxidation state that ranges from -2 to +6, which allows it to combine with many elements creating over 50 known minerals.

The lowest amounts of selenium occur in light sandy soils. Clay soils have the ability to absorb selenium as do organic soils. Soil microbes play an important part in making selenium available for plants to absorb.

Selenium is another element that has the property "hormesis" which means small amounts are beneficial and large amounts are bad. It was first discovered that selenium was critical to human health in 1975 by a researcher in Galveston, Texas.

Selenium was first used in pottery to give a red glaze and later as a pigment for dyes to get an orange and maroon color. Selenium was used in many solid-state electronics before silicon and germanium semi-conductors became available.

Selenium photocells were used in photographer's light meters and Xerographic photocopiers and laser printers. They use selenium in a form that when dark it acts as an insulator but when exposed to light it becomes a conductor of electricity.

Selenium sulfide (Se_3S_5) is a common ingredient in dandruff shampoos.

Selenium is an efficient anti-oxidant (anti-peroxidant) and is found in the molecule glutathione peroxidase enzyme system. It prevents body fats from going rancid.

Selenium is an essential micronutrient that comes from our diet. It is estimated that over one billion people in the world are selenium deficient.

Higher levels of selenium in the blood are associated with a decreased risk of developing liver cancer (American Journal of Clinical Nutrition, International Agency for Research on Cancer, 2016).



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Many areas of the United States (Texas, southwest, lower southeast, and northwestern mountain states) have very selenium deficient soils hence plants grown in the area also selenium deficient. Medical studies have found that America's "Stroke Belt" runs right across America where selenium content in soils is low.

Selenium is important in protecting humans against chronic degenerative diseases, as it is required in the production of powerful antioxidants such as vitamin E and glutathione peroxidase (an enzyme that converts hydrogen peroxide into water).

A study found that when older people who took a combination of CoQ10 and selenium daily for four years, they suffered far 50% fewer heart attacks.

The amount of beta-carotene and vitamins C and E contained in herbs (mints), are linked to the amount of selenium in soil. The effectiveness of anti-oxidants in our bodies has also been linked to the presence of this element. Animals and humans obtain selenium from the foods they eat, however, if it is not in the soil then it will not be in the food.

A lack of the mineral selenium leads to muscular dystrophy, cancer, heart disease, cirrhosis of the liver, and cataracts along with cardiomyopathy and joint problems.

Selenium is a co-factor for at least 25 enzymes that cannot function without it. It helps protect the body from DNA damage, and it helps eliminate toxic heavy metals from the body. As long as the body has adequate levels of selenium then the body also rids itself of excess beryllium. Selenium helps protect the body against toxic metal poisoning as it can block heavy metal bioavailability and reduce the toxicity.

Mercury can cause a depletion of selenium in our bodies. Selenium binds readily with mercury into a compound that can be removed from the body as a waste product. Methyl mercury blocks selenium related enzymes from functioning correctly. Note: Methyl mercury is found in fish.



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Studies show that those with lower selenium levels have much higher incidence of all forms of cancer. Studies of colon cancer survivors with highest levels of selenium were found to be the least likely for recurrence. Research has shown that selenium contributes to anti-oxidant pathways which stimulate apoptosis (cell death) in human cancer cells. A lack of selenium (Se) allows viruses to replicate more quickly.

The body cannot absorb selenium very well in some forms like L-selenomethionine, however one of the best forms for the human body to absorb selenium is from selenium enriched yeasts (fungi).

Cardio-myopathy (heart attacks), white muscle disease in animals, liver spots and age spots are all linked to selenium deficiency. Low levels of selenium have been associated with pancreatic cancer. As we get older, we tend to lose the ability to absorb selenium. As men's level of selenium decrease, their sperm count and quality does also.

Recent studies have linked low levels of selenium to cognitive decline in the elderly. Mothers whom have adequate selenium levels tend to have children with better brain function. Children that have adequate selenium levels tend to perform better on all cognitive tests.

An animal study published in the journal Cell has found that selenium helps prevents neurons from dying, illustrating the elements role in mitigating cell death and preventing dementia. Selenium is used in an enzyme called GPX4, it was found essential to life. Another study in the Journal of Nutrition, found that adequate selenium levels helped prevent the onset of depressive symptoms and negative mood.



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A study in the American Journal of Epidemiology showed that selenium intake reduced brain loss associated with aging.

There is also a strong link to osteoporosis, as higher rates of problems are associated with low selenium levels. The human thyroid gland has the highest level of selenium.

Some of the health problems and diseases that have been linked to a selenium deficiency are:

HIV (Aids)

Anemia (RBC fragility)

Age spots and Liver spots

Asthma

Fatigue

Fertility issues

Muscular weakness

Myalgia

Scoliosis

Muscular Dystrophy

Cystic Fibrosis

Cardiomyopathy

Multiple Sclerosis (associated with mercury poisoning)



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Heart palpitations

Irregular heartbeat

Liver cirrhosis

Pancreatic atrophy

Lou Gering's Disease (also with mercury poisoning)

Alzheimer's disease (with high vegetable oil consumption)

Infertility, Low birth weight babies

High infant mortality

Sudden Infant Death Syndrome (SIDS)

Cancer

Sickle Cell Anemia

A study in Nutritional Health and Ageing on elderly people in Italy found that having a high selenium level was associated with a 29% lower risk of death from all causes.

As one Doctor stated, "a high intake of vegetable oils, cooking oils, and margarine concurrent with a selenium deficiency is a quick way to a heart attack".

Most of the selenium we absorb, 50-80% is excreted in our urine. It is not common but excess selenium can cause garlic breath and is the first sign of selenium poisoning.

Selenium in the form hydrogen selenide gas (H_2Se) is extremely toxic.

A few sources of selenium are sodium selenite a simple chemical salt (Na_2SeO_3), Selenium-methyl L-selenocysteine, and high selenium brewer's yeast. Brazil nuts are a good source of selenium. Pasture raised eggs, shellfish, organ meats, wild caught Alaskan salmon and many seeds.

Gardening and Landscaping Problems Associated with Selenium (Se)

Some plants require selenium while other does not. Members of the *Astragalus* family tend to colonize selenium rich soil, as they require it. Some members are known as "Locoweed" due to the high levels of selenium they absorb and its effects on animals whom eat it. Its presence often indicates soils with high selenium levels.

Rhizobium bacteria and root exudates stimulate the oxidation (adds an extra oxygen atom to the molecule) of SeO_3 to SeO_4 which increases the availability of selenium to plants.

Some studies have found that adequate selenium in the soil stimulates the growth of grasses and other plants, while too much can be toxic.

Brassica plants have a high ability to absorb selenium from the soil, as do many mushrooms and ferns that can absorb selenium in larger amounts. The mushroom *Albatrellus pes-caprae* that is a popular food in Italy can have 3,700 ppm of selenium.

Sources: Brazil nuts, free-range chickens, turkey and pork, fish, free range organic eggs, shellfish, liver from grass fed beef or lamb, some coal ash (10-6,000 ppm), Coconuts



I was asked the other day how to get selenium into our soils so the vegetables and fruits can absorb it. The Re-Mineralizer product from Nature's Way Resources is a source of selenium since it has granite and basalt sands in it. Additionally, it has all the other trace and micronutrients. One must also use biological methods (organic) or the toxic chemicals will kill the microbes that help plants absorb selenium

Remember from our study of glyphosate a couple years ago, this toxic chemical used in products like Round-Up, prevents the body from absorbing elements like calcium, magnesium, *zinc and selenium* . If your food is not certified organic, then most likely it has glyphosate in them. Genetically modified foods have even higher levels of this dangerous chemical in them.