

## **Minerals and You Class Four = Se, Co, F**

DTRCN: In a study reported by the U of CA, Berkeley, they used Rats to study selenium. They were getting good results and were able to take the study on to human subjects. This is a quote of their findings "We now have an opportunity to eliminate up to 50% of the top 3 cancer killers in our time. This is like the discovery of penicillin or the polio vaccine."

The actual study involved 1300 people treated for skin cancer. Half were given 200mcg of Se and half were given a placebo. The RESULTS were: The Se did NOT reduce the risk of skin cancer reoccurring which was what they were looking for, BUT the Se group had 63% lower risk of prostate, colon and lung cancer and 50% fewer other cancer deaths.

These benefits were so great that the study which was to last 10 yrs was stopped after 8 yrs so the placebo group could also take the real Se since their cancer deaths were higher.

CONCLUSION: Se inhibited tumor growth by killing early cancer cells at the beginning stage.

DTRCN: **SELENIUM = Se**

DTRCN: TOXICITY: Se can be toxic. Due to this for many years it was NOT considered an essential mineral but a dangerous mineral to ones health.

"Adequate Se intake is .....necessary for optimal health and full life span potential." quotes Saul Hendler, Md. In "The Doctor's Vit. & Min. Encyclopedia"

DTRCN: Studies show that toxicity does not show up until 2,400-3000 mcg per day is given over many months. (Nutrition Reviews 34:347, 1976)

DTRCN: **FUNCTION:**

DTRCN: The common denominator of chronic disease and aging is oxidant damage to the cells.

DTRCN: 1) main function of Se is preventing this oxidation of cells. Se works with Vit E as an anti-oxidant.

DTRCN: 2) capable of detoxifying heavy metals, drugs, alcohol, cigarette smoke and peroxidized fat

DTRCN: **OHA = 200-400mcg**

RDA =70mcg/men and 55mcg/women

DTRCN: Dr. Hendler recommends 200-400mcg with the note that a higher dosage should be done with your physicians approval only...they have used doses up to 1000mcg on pts with no side effects but 200-400 should be adequate for most people.

DTRCN: **Symptoms of Se overdose**

- 1) black fingernails
- 2) garlic odor on breath and skin when not eating it
- 3) dizziness
- 4) nausea
- 5) metallic taste in mouth

NOTE: **Se deficiency** occurs in most warm blooded animals.

**Symptoms** include:

- 1) cataracts
- 2) depression
- 3) muscular dystrophy
- 4) liver necrosis
- 5) cancer

**SOURCES:** brewers yeast, broccoli, cabbage, celery, mushrooms, grains, fish

DTRCN: Most people get less than 50mcgs daily..and the biggest determining factor is the SOIL. If the soil where our food is being grown is depleted, then adequate Se in the diet is impossible without supplementation.

**NOTE:** So Dakota has the highest Se soil content and Ohio has the lowest SD has the lowest cancer mortality rate while OH has double their rate.

**NOTE:** Japanese women while in Japan have the lowest breast cancer rate due to the high Se content in the soil yet when they come to USA they have twice the Cancer rate.

Georgia and the Carolinas have the highest stroke rate in the US and they also have low Se in their soil.

DTRCN: Dr. Eric Trimmer writes: " If Se in the crops dips below 0.03 part per million the cancer rate goes up to 11% above the average."

DTRCN: Se can detoxify mercury and cadmium, toxic heavy metals, from the body.

Supplements: Organic Se is the best form according to Dr Hendler and it is derived from Brewers Yeast. The major "food" form of Se is call L-selenomenthionine.

**NOTE:** Vit C will prevent absorption of "Inorganic" Se the inorganic forms are: sodium selenite and sodium selenate

Se is also lost due to the refining process of our foods.

Richard Passwater, PhD states, "only traces of Se are needed ..one cannot assume these traces are met in the diet because food tables cannot accurately count the amount of Se since foods are dependent on where their grown and amounts may vary a thousand fold from one crop to the next." (Whole Foods, Sept. 1986)

DAlexan451: Anything about Fl. soil?

DTRCN: I did not have any specifics on Fl soil. They did not give it as an example

DAlexan451: I should have asked sooner--What is OHA?

DTRCN: **Optimal Health Allowance** these are amounts taken for Optimal health not just maintenance.

DAlexan451: I got Dr. Weil's mineral suggestions for me. How do people take all this in one day?

DTRCN: I have come up with a high maintenance program for myself without spending tons of dollars.

DTRCN: if you are interested I can tell you what it is.

DAlexan451: Please....

DTRCN: I take a one a day Multiple Vitamin mineral by solaray

DTRCN: I take B-complex 50 twice a day

DTRCN: I take Vit C 1000 once a day

DTRCN: One a Day antioxidant formual 1 a day

DTRCN: I take a multi mineral every other day.

I use capsules as I have very poor digestion and they do well. I feel well and that is how I gauge if my program is working.

DAlexan451: Is the seleneum in the multi mineral?

DTRCN: Se is in my multi v/m, antioxidant, and multi min.

DTRCN: Minerals are usually excreted if not needed so toxicity is rare.

DTRCN: as one gets older our systems don't work as well. I think I can use all the help I can.

DTRCN: **FLUORIDE = F**

DTRCN: Although fluoride has been shown to be beneficial it has **NOT** been established as Nutritionally Essential

DTRCN: There is no RDA or OHA for Fluoride

**NOTE:** Children have **died** from eating toothpaste because of the F1 content.

DTRCN: If one should accidentally swallow toothpaste or mouthwash with fluoride, then drink MILK

Ca = calcium is an antidote for fluoride toxicity.

DTRCN: Fluoride is added to most water therefore, I do not recommend supplementing unless on authority of a Dr.

DTRCN: **COBALT = Co**

**HISTORY:** Co was linked to diseases in animals and adding Co from iron ore seemed to help relieve the symptoms.

**PROPERTIES:** Co is used by the intestinal tract microorganisms to produce a cobalt-containing organic compound that reverses the deficiency. That organic compound is Vitamin B12.

Co is a dietary essential for humans since it is the structural component of B12. Humans must consume Co in the preformed vitamin.

DTRCN: Co has a low toxicity

DTRCN: Co is red and is the red component of B12.

**OHA-RDA: NONE**

DTRCN: **FUNCTION:**

DTRCN: 1) component of B12

DTRCN: 2) essential to normal function of ALL cells

**SOURCES:** meat, milk, poultry, some in veggies but not much and it can depend upon the selenium content of the soil.

Co is really important to B12. If there is a B12 def, which is somewhat common, there can be a Co deficiency. because of the synergistics of Vit/Min it is impossible for only one to be affected.

DAlexan451: I noticed that you don't take calcium. Any reason or do you get it elsewhere?

DTRCN: Ca is in my multi v/m and multi min but I had a baseline bone scan and have very dense bones for a woman my age so don't worry much about it. I also eat yogurt and cheese tho don't like milk much.

DAlexan451: Why would my female gyn not be concerned about me getting a base line bone scan?

DAlexan451: I'm 50  
DTRCN: expense but I think it is a wonderful screening tool. 50 and are you in peri menopause?  
DAlexan451: I'm all done!  
DTRCN: are you on HRT  
DAlexan451: Yes, prempo  
DTRCN: that may be the reason as estrogen has a Ca protection factor.  
DAlexan451: I think that is her reasoning. So as long as I take it, I should be ok?  
DTRCN: It helps the bone retain Ca...also if Osteoporosis does not run in your family she may not see a reason for it..but I feel a baseline should be done in the early 40's to get a good idea for most women of how the levels change due to menopause.

DTRCN: by the time the change has begun it is sometimes a little too late for preventive measures.

DTRCN: some test I feel are necessary for prevention are:

1) yearly blood test called has various names but the full test not just cbc.

2) thyroid test

3) bone scan

4) a good yearly physical

5) a mammogram. (baseline after 30 and try to use same facility for comparison)

DTRCN: I always encourage my clients to get a copy of their records.

DTRCN: **Iron = Fe**

Penn State Study: Female students who took tests requiring memory and logic after being diagnosed with iron-deficiency anemia were given Iron supplements and then retook the test 3 months later and most showed a 20% improvement on the test.

DTRCN: Iron deficiency Anemia is the most prevalent nutritional problem in the world.

DTRCN: **FUNCTIONS:**

DTRCN: 1) Respiration = O<sub>2</sub> to the cells and Co<sub>2</sub> away

DTRCN: 2) Formation of hemoglobin which performs the above task

DTRCN: 3) Formation of Myoglobin which functions in the muscle cells. Myoglobin supplies O<sub>2</sub> to muscle cells for use in the chemical reaction that results in muscle contraction.

DTRCN: 4) Assist with immune functions

DTRCN: 5) produces carnitine which is necessary for the oxidation of fatty acids

DTRCN: 6) aids memory functions  
DTRCN: 7) helps produce collagen and elastin, components of connective tissue

DTRCN: TWO TYPES OF Fe:

DTRCN: 1) Heme iron = Heme iron is the most easily absorbed, it is absorbed into the mucosal cells and is not affected by meals or gastrointestinal secretions..but it is affected by an Fe deficiency. Heme iron represents about 10% of dietary iron and absorption is lucky to be 25%.

DTRCN: 2) Non Heme iron = is affected by food ingested. Non heme iron needs gastric secretions to be absorbed.

**SOURCES:** Red meat

DTRCN: mucosal cells = mucosal cells are the cells in the body that produce mucus they are basically lining cells such as in the nose and stomach.

DTRCN: **ABSORPTION:**

DTRCN: 1) Vit C enhances Fe absorption

DTRCN: 2) Acid medium assists with Fe absorption

DTRCN: 3) High Ca (calcium) intake will inhibit Fe absorption

**NOTE:** Red blood cells (RBC) only live about 4 months and the iron from the old cells is reabsorbed if needed immediately or stored in the liver or spleen.

DTRCN: 4) Coffee, tea, antacids, soft drinks, aspirin are other items that stop Fe absorption.

DTRCN: **DEFICIENCIES:** can be caused by

DTRCN: 1) illness

DTRCN: 2) blood loss due to hookworm

DTRCN: 3) hemorrhage

DTRCN: 4) fat malabsorption

DTRCN: 5) PEM = protein energy malnutrition

DTRCN: **NOTE:** as infants hemoglobin forms in the liver and spleen as adults it forms mostly in the bone marrow

DTRCN: Hemoglobin = red oxygen carrying part of the blood

DTRCN: Heme = red compound containing iron and copper in hemoglobin

Anemia though prevalent is NOT a disease it is a sign of the presence of a disease process.

**ANEMIA's:** diet related

DTRCN: Pernicious Anemia = lack of Vit B12

DTRCN: Iron Deficiency Anemia = lack of Iron  
DTRCN: Folic Acid Anemia = lack of Folic Acid a B vitamin

DTRCN: **OHA = 15mg**  
DTRCN: RDA = Men 10-12mg Women 15mg

DTRCN: Carbonyl iron is the best supplemental form absorbed by the body. Ferrous gluconate is also well absorbed and ferrous sulfate is the least absorbed.

DTRCN: If calcium interferes with iron absorption, then how do we supplement calcium?

DTRCN: It is high Ca intake which is over 2000mg a day and if one takes higher Ca, they need to increase other minerals to compensate and that really is NOT acceptable. Staying within the OHA should prevent any problems.

DAlexan451: sources-how about egg yolk, raisins, cast iron skillet, and of course, liver?

DTRCN: liver is considered red meat...iron skillet my understanding is what absorbs into the cooked food and that may not be available in that form in the body.

DAlexan451: Do women who have stopped menstruating have a high rate of anemia?

DTRCN: no as they are no longer losing blood.

DAlexan451: Is the redness of the inner eyelid a valid check for anemia?

DTRCN: some people use it I would rather trust a blood test.

DTRCN: "Cow's milk and eggs do not enhance absorption of non-heme iron" (F, N, Diet therapy book)

DTRCN: "vitamin C is the most potent enhancer of iron absorption known."

DTRCN: raisins are high if you eat 1c. I think the sugar rush would outweigh the good of the iron.

DTRCN: **COPPER = Cu**

DTRCN: **FUNCTIONS:**

DTRCN: 1) helps Fe carry O<sub>2</sub> in the blood using hemoglobin as a transport

DTRCN: 2) assist in producing collagen which is the formation of skin

DTRCN: 3) produces melanin = pigment in your skin and hair

DTRCN: 4) helps produce elastin = elastic properties of the blood vessels

DTRCN: Cu deficiency is the 2nd highest deficiency in hospital patients on tube feedings.

DTRCN: **DEFICIENCY:** A deficiency will show up as anemia, low white blood cell count, and loss of bone density.

DTRCN: **ABSORPTION:**

DTRCN: 1) uptake can be affected by high sugar intake

DTRCN: 2) prolonged high Vit C intake can affect Cu absorption

DTRCN: 3) Zinc is antagonistic to Cu so if you take a Zinc supplement of

DTRCN: 150 mg for over a year you may create a copper deficiency.

**NOTE:** Cu deficiency has been shown to cause emphysema in pigs.

DTRCN: **NOTE:** Almost all of our current nutritional knowledge about Cu comes from Animal research.

DTRCN: Hi vit c---How high?

DTRCN: The book did not give an exact figure but stated mega dose. The RDA for Vit C is only 60 mg but they are now stating it needs to be 500 mg

**OHA & RDA = 1.5 - 3 mg**

**RATIO:** >the ratio for Zn to Cu is 10/1  
10 times the amount of Zn as that of Cu

**SOURCES:** dried beans, shellfish, oysters, nuts, fruits

**NOTE:** recent studies show individuals may be consuming sub-optimal amounts of Cu NOT low enough to cause overt deficiency but Low enough to affect life span per Dr Hendler.

COPPER is best taken in a Mineral Supplement and **NOT** singly.

DTRCN: **ZINC = Zn**

**HISTORY:** Zinc deficiency manifested as "clay eating" or PICA til it was recognized as a mineral deficiency.

DTRCN: Many health care professionals now believe a wide spread marginal deficiency exists as disease and physical injury can alter Zn metabolism and excretion.

DTRCN: Zn is an essential trace mineral for humans, plants and animals clay eating?--PICA?



DAlexan451: Isn't pica associated with Iron? Also, they use to eat laundry starch. Ug!

DTRCN: Pica actually means the ingestion of unsuitable substances having little or no nutritional value but usually associated with Zn. This was noted when people (pregnant women, etc) ate dirt, clay, burnt matches. The common denominator was the minerals in the substances and deficiency in the person.

DTRCN: This process is still not well understood.

DAlexan451: American Indians eat the clay

DTRCN: That is the Text book summary. many traditions from cultures came about from practices that they found helped for an illness they didn't understand. But it helped so they continue to use it.

DTRCN: it is common mostly in lower class families

DTRCN: they usually do not get the chance to eat healthy diets.

DAlexan451: How about crunching ice?

DTRCN: this is one they do not understand and I don't think anyone knows the real reason though there are many speculations. with pica/mineral deficiency being one, I have also heard vit B6.

DTRCN: The average body contains 3g of Zn and 60% is in the muscles and bones with 20% in the skin.

DTRCN: The highest concentration for men is found in the Prostate gland.

DTRCN: High concentrations are also found in the red and white blood cells.

#### **FUNCTIONS:**

DTRCN: Zn functions in over 200 enzymatic systems in the body.

DTRCN: 1) It is involved with synthesis of carbohydrates, lipids, and protein

DTRCN: 2) helps detoxify alcohol in the body

DTRCN: 3) Zn is necessary for the secretion, synthesis and utilization of insulin

DTRCN: 4) vital for healthy male sex hormone and prostate function

DTRCN: 5) necessary for good tooth and bone structure

DTRCN: 6) vital for normal skin functions

DTRCN: 7) plays a key role in DNA synthesis

DTRCN: 8) it is necessary for producing brain neurotransmitters and low Zn may play a role in the development of Alzheimer's

DTRCN: Zn and Cu have related roles in body functions and the balance of the two nutrients is very important. Dr Hendler recommends **15-30mg Zn, 1.5-3mg Cu, plus 50-200 mcg Selenium**

DTRCN: **ABSORPTION:**

DTRCN: 1) Zn is lost from the bone if Ca is lost from the bone

DTRCN: 2) high Fe intake can reduce zinc levels

DTRCN: 3) phosphate added to colas hinder Zn absorption

DTRCN: 4) high Cu depresses zinc absorption

DTRCN: 5) caffeine, diuretics, some antibiotics hinder absorption

DTRCN: 6) Alcohol decreases absorption and Increases excretion

DTRCN: 7) Food additives can lower Zn absorption

DTRCN: .

DTRCN: 14-40% of dietary Zn may be absorbed but it is affected by body size and the level of Zn in the diet. The larger the body the more that is absorbed and the less Zn eaten the more body will take from what is eaten if iron affects zinc input and copper also affects zinc input, how are we ever going to know when we are maintaining a 10 to 1 ratio

DTRCN: you do NOT know but the body does and most supplements have the ratio accounted for.

they are talking mega doses and that usually means in "their" terms 10 times the RDA.

DTRCN: Supplementation is a good Insurance Policy.

DTRCN: You do NOT know what the body is going to do but

DTRCN: you do know one thing: you know what it can NOT do if the nutrients are NOT available. It cannot function properly. So since we are all different and have different needs it makes sense to offer the body nutrients from your food "first" and additional from supplementation

DTRCN: Zn from animal and fish sources seem to be better absorbed than from veggies.

DTRCN: High fiber diets can lower zinc absorption as the phytates in the cereals and veggies bind with the Zn and make it unusable.

DTRCN: NOTE: "as western diets shift from red meat consumption to cereal proteins more cases of Zn deficiency may develop."

DTRCN: **DEFICIENCY SYMPTOMS for Zn:**

- DTRCN: 1) eczema on face and hands
- DTRCN: 2) hair loss
- DTRCN: 3) mental apathy
- DTRCN: 4) delayed sexual maturation (children)
- DTRCN: 5) decreases growth rate (children)
- DTRCN: 6) impaired mental development

**SOURCES:** meat, eggs, seafood, milk (human milk is higher and better absorbed than cows milk)

**OHA = 15 - 30mg**      RDA = 15mg

**TOXICITY:** rare but high doses, as 50mg, may cause a Cu deficiency ..Key word is MAY

DAlexan451: Do non meat eating countries have zinc deficiencies?

DTRCN: Which country would that be? Most countries I know eat meat, fish or poultry. Vegans have a higher risk of deficiency.

DAlexan451: They eat less in the Orient but I guess fish is included

DTRCN: and many eat it raw so the cooking would not destroy any of the nutrients. The real problem is bioavailability in the body because it needs other nutrients to function properly and those may not be available so the Zn would not be utilized by the body.

DTRCN: **Last Class OHA's vs RDA's**

DTRCN: Six Requirements for Life

- DTRCN: 1) Protein
- DTRCN: 2) Carbohydrates
- DTRCN: 3) Fat
- DTRCN: 4) Vitamins
- DTRCN: 5) Minerals
- DTRCN: 6) Water

**Quote:** "Despite a so called "balanced diet" much food ingested is **NOT** broken down far enough during digestion to release the essential nutrients it contains."

(Absorption & Utilization of Amino Acids, Mendel Friedman, US Dept of Agriculture 1989)

## List of Problems hindering absorption of All Nutrients

Antacids, stress, diarrhea, constipation, alcohol, aspirin, extensive exercise, diverticulitis, high ingestion of processed foods, gastritis, gall bladder disease, any malabsorption problem, hiatal hernia, age/elderly-teens, poor diet, birth control pills, etc

Per book on "Understanding Normal & Clinical Nutrition" there are only 3 reasons to supplement.

DTRCN: 1) On a Dr's recommendation  
DTRCN: 2) Eating below 1,500 cal a day  
DTRCN: 3) When you KNOW you will be eating irregularly (but they did not specify what/how much/when "regular" was)

DTRCN: **Mineral deficiency tests:**

DTRCN: **Hair Analysis**

DTRCN: 1) can show high Lead for city dwellers. It does not correlate to intake but to lead content in the air  
DTRCN: 2) standardized test are NOT available as there is not a normal value for hair  
DTRCN: 3) standard lab procedures are not controlled

DTRCN: **Blood**

DTRCN: 1) lab procedures controlled and fairly reliable  
DTRCN: 2) do not always show true value as blood values show normal yet body may be robbing from bones, etc to keep blood levels up.

DTRCN: **Bone Density**

DTRCN: 1) ususally done in hospital and is expensive  
DTRCN: 2) test is controlled and standardized so reliable

## CLINICAL SIGNS for MINERAL DEFICIENCIES

DTRCN: 1) Spoon-shaped nails = iron Fe  
DTRCN: 2) Brittle or ridged nails = iron Fe  
DTRCN: 3) moon face/paleness = iron Fe  
DTRCN: 4) thyroid enlargement = iodine I  
DTRCN: 5) white streaks in nails = zinc Zn  
DTRCN: 6) brittle bones-bone thinning(osteoporosis) = calcium Ca

DTRCN: this is just a small list and we also have mentioned some in class.

DTRCN: NOTE: Unless otherwise specified, it is best to take supplements over the course of a day and with meals. This means you will get results all day long.

Optimal Health Allowance (OHA) as opposed to the RDA.

**Calcium = Ca      OHA = 1500mg**

RDA = 1200mg til age 24 then 800mg

taken as Ca carbonate (needs acid medium), gluconate, or lactate.

**Magnesium = Mg      OHA = 200-400mg Mg**

gluconate absorbs the best

RDA = 350mg men, 280mg women

deficiency is common today

The electrolytes = Potassium =K, Sodium =Na, Chloride =Cl

OHA = NONE      RDA = NONE

there is usually no problem with getting enough of these minerals

DTRCN:      These should be taken as supplements with a doctors advice ONLY

DTRCN:      Athletes and people who exercise a lot have a problem with high excretion and should supplement

**Phosphorus = P      OHA = 1000mg      RDA = 800mg**

Antacids deplete P, alcoholics are especially at risk

Use foods if a deficiency occurs      ONLY take supplemental P with a doctors advice

**Zinc = Zn      OHA = 15-30mg      RDA = 15 mg men -12 mg women**

gluconate/orotate forms are best for absorption

**Iron = Fe      OHA = 15mg      RDA = 10mg men 15mg women**

DTRCN:      Vit C helps absorption and Ca inhibits absorption so do not take single supplements of Ca and Fe together.

**NOTE:** 3cups of coffee or 6 soft drinks a day can deplete your iron

**Selenium = Se      OHA = 200mcg**

DTRCN:      RDA = 70mcg men-55mcg women

DTRCN:      the best form is natural from Brewers Yeast.      Do not take it with C

**Chromium = Cr      OHA = 50-200mcg      RDA = unknown**

DTRCN:      again the best form is from Brewers Yeast.

DTRCN:      Most diets are below 50mcg.      Diabetics may benefit from Cr.

**Manganese = Mn OHA = 5mg and not to exceed 10mg**

DTRCN: RDA = 2-5mg

best form is from sulfate or gluconate

**Molybdenum = Mo OHA = .5mg or 50-100mcg**

DTRCN: RDA = .075-.25mg

it needs copper for absorption but also competes with copper and can be used to remove excess Cu from the body.

**Copper = Cu OHA = 1.5-3mg RDA = 1.5-3mg**

Keep Cu in ratio to Zn of 10/1 ex: 15-30mg Zn and 1.5-3mg Cu.

**Iodine =I OHA = 150mcg RDA = 150mcg**

usually available from iodized salt but if on low salt diet eat seafood or may need to supplement

**Fluorine =F OHA = no more than 1mcg RDA = none known**

if drinking fluoridated water you should not need to add any. Fluoride is **toxic**.

**Sulfur = S OHA = should not need,** unless a vegetarian or do not eat meat and eggs.

DTRCN: RDA = none known

DTRCN: Dr. Hendler recommends using a complete mineral supplement.

DTRCN: NOTE: The body NEEDS vitamins and minerals in balance. If you wish to add a single supplement, be sure you are taking a multiple then you can add a single nutrient.

DTRCN: If the body gets out of balance, it can cause more deficiencies.

DTRCN: **Vitamin Breakdown Test**

DTRCN: 1) Use 1/2 cup vinegar at room temp (this acts like the Hcl in the stomach) use a cup you can stir in.

DTRCN: 2) Drop in your vitamin supplement

DTRCN: 3) Stir the vitamin and vinegar every FIVE minutes for THIRTY minutes.

DTRCN: If the vitamin has not disintegrated within that amount of time then, the book this test came from suggest, change brands.

DTRCN: Now if the tablet does break down you can assume they are available for absorption.

CAUTION: Do not assume they are being absorbed, that is up to the body, and its needs. You should be able to tell mainly by how you feel and your all around good health.

DTRCN: Some are enteric coated and that may or may not be good as only if one has really good digestion will these work and it may be too late for some nutrients and too early for others as the enteric coating is to prohibit them from breaking down in the stomach.