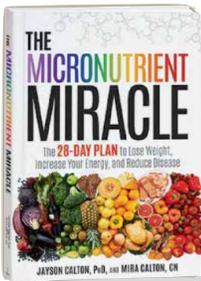


THE MICRONUTRIENT MIRACLE

Your Orchestra of Micronutrients: A complete guide from A to Z



Mira Calton, CN & Jayson Calton, PhD



THE MICRONUTRIENT MIRACLE

TABLE OF CONTENTS

About the Caltons	1
Gift Page	2
The Orchestra of Micronutrients Image	3
The Essential Micronutrients Creating a Symphony of Perfect Health	4
Introducing The Vitamins	8
Introducing The Minerals	24
Introducing The Essential Fatty Acids	40
Introducing The Amino Acids	43
Smart Supplementation Guidelines	49

BUT FIRST, WHO ARE WE? AND WHY ARE WE SO PASSIONATE ABOUT MICRONUTRIENTS?

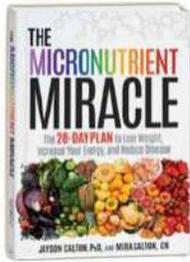
After working together to reverse Mira’s advanced osteoporosis **we became impassioned about the healing power of micronutrients** (vitamins, minerals, essential fatty acids, and amino acids). We traveled to more than 100 countries over 6 years on a global expedition we named **The Calton Project**, to study the dietary and lifestyle habits of people from vastly different cultures. Our research has given us a unique global perspective on nutrition and wellness, it has allowed us to intimately observe how different nutritional philosophies and lifestyle habits effect ones health, but most importantly to discover what we believe to be, not only the most widespread and dangerous health condition of the 21st century, but the root cause of modern disease...**Micronutrient Deficiency**.



We have dedicated our lives to researching **the link between micronutrient deficiency and disease** and sharing our discoveries with the world. We are so excited to share our findings with you!

If you are suffering from stalled weight loss, low energy, a sluggish thyroid, brain fog, stress, anxiety, depression, osteoporosis, cancer, high cholesterol, hypertension, diabetes, or any other health condition or lifestyle disease then we have good news for you! **Modern medical and nutritional science now knows that your health condition or disease is likely being caused by a deficiency in one or more of your essential micronutrients.** Our [Micronutrient Miracle 28-Day Plan](#) can help you to eliminate those deficiencies and **put you on the path to reclaim your health and live the extraordinary life you were born to live!**





THE MICRONUTRIENT MIRACLE

GUIDE TO:

Your Orchestra of Micronutrients



The Strings Section or Essential Minerals

Macrominerals

Calcium
Chloride
Magnesium
Phosphorus
Potassium
Sodium

Trace Minerals

Boron
Chromium
Copper
Iodine
Iron
Manganese
Molybdenum
Selenium
Silica
Zinc



The Percussion Section or Essential Fatty Acids (EFAs)

Omega-3

EPA

DHA

Omega-6

DGA

DGLA

AA

DA



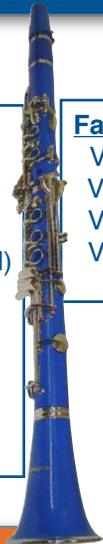
The Woodwinds Section or Essential Vitamins

Water-soluble

Vitamin B1 (Thiamine)
Vitamin B2 (Riboflavin)
Vitamin B3 (Niacin)
Vitamin B5 (Pantothenic acid)
Vitamin B6 (Pyridoxine)
Vitamin B7 (Biotin)
Vitamin B9 (Folic acid)
Vitamin B12 (Cobalamin)
Vitamin C (Ascorbic acid)
Choline

Fat-soluble

Vitamin A
Vitamin D
Vitamin E
Vitamin K



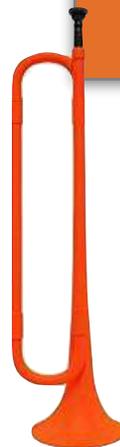
The Brass Section or Essential Amino Acids

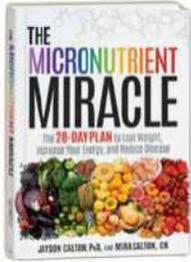
Essential

Histidine
Isoleucine
Leucine
Lysine
Methionine
Phenylalanine
Threonine
Tryptophan
Valine

Conditionally Essential

Arginine
Cysteine
Glutamine
Tyrosine
Glycine
Ornithine
Proline
Serine





THE MICRONUTRIENT MIRACLE

GUIDE TO:

Your Essential Micronutrients: Creating a Symphony of Perfect Health



Ok, we are going to ask you to use your imagination for a minute, but trust us, by the time we finish explaining our “Orchestra Analogy” you will know more about how your essential micronutrients work and relate to one another, and more importantly how they can prevent and reverse disease, than your average health professional. Let’s start by thinking of all the essential micronutrients (i.e. vitamins, minerals, essential fatty acids, and amino acids) as a big orchestra, and each individual micronutrient (i.e. calcium, vitamin D, etc.) as a different instrument in the orchestra. Got that picture in your head? Good, now in order to successfully play a specific piece of music (the equivalent to the body successfully carrying out a specific essential function—like bone building or hormone production), all the instruments (or micronutrients) that are required for that specific piece of music must be present. When one or several instruments (micronutrients) are missing, the orchestra (body) will not be able to successfully play the piece (carry out the specific essential function), and this will lead to a subpar performance (health condition or disease). Pretty simple so far, right?

Now, just as a standard orchestra generally has four sections: strings, woodwinds, percussion and brass, the human body plays its sweet music through processing and utilizing four specific types of micronutrients: vitamins, minerals, essential fatty acids, and amino acids. And like the orchestra, each of the four sections is made up of similar, yet vastly different, instruments. Let’s take a moment to explore the four sections and get a better understanding about their similarities and differences.

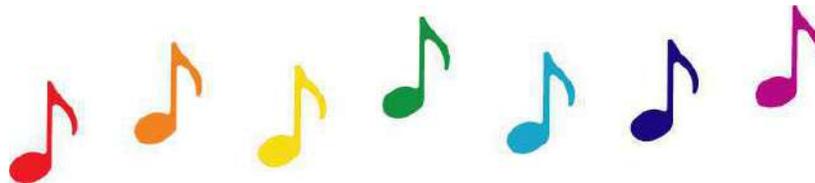
Introducing the Minerals (aka The String Instruments)

The string instruments include the violin, guitar, sitar, electric bass, viola, cello, harp, double bass, rebab, banjo, mandolin, and the ukulele. And as their name implies, they all create music through the vibration of strings. However, while they have that in common, the resulting sound that each produces is vastly different. When Beethoven composed his “Ode to Joy” for the violin, he didn’t assume any string instrument could represent the ethereal nature of the melody—certainly not a banjo or an electric bass. Because each string instrument offers such a unique tone, they are not interchangeable.

The same is true of minerals. All minerals are found in the earth's soil and water. Plants don't create minerals; they must extract them from the soil as they grow. So all minerals have that in common. However, much like the stringed instruments we mentioned earlier, minerals too are not interchangeable. For example, calcium, one of the essential minerals, is required for muscle contraction, while zinc, another essential mineral, supports smell and taste. If your body is deficient in calcium, zinc won't help your muscles contract. And, conversely, if your body is short on zinc, calcium cannot aid in flavor or smell perception.

Introducing the Vitamins (aka Woodwind Instruments)

Continuing our analogy, all the instruments in the woodwind section are similar in that they make music by blowing air (wind) through a tube once made of, well, wood, of course. Well, vitamins have something in common as well. Vitamins are not found in soil or water like minerals. Instead, they are produced by the plants and animals we consume. Additionally, while some woodwind instruments, like the oboe or clarinet, use reeds to make their musical melodies, others, like the flute or piccolo are reedless. The vitamin family can also be subdivided by characteristics. Vitamins can be either fat-soluble or water-soluble. The fat-soluble vitamins—A, D, E, and K— need fat (to stimulate the release of bile acids) to be absorbed properly and can be stored in significant amounts in your body fat and liver until they are needed. All of the other vitamins are water-soluble, which means they do not need fat to be properly absorbed, and cannot be stored in the body in significant amounts (B12 is an exception). Instead, water-soluble vitamins travel through the bloodstream, and if the body does not use them, they are eliminated through urination. Just like the minerals, one vitamin cannot take the place of another vitamin. Their functions are as unique as the sound of a clarinet or a flute. Vitamin A, for example, aids in night vision, while vitamin B9, also called folate, helps prevent spina bifida in newborns, but one cannot do the others job. Are you seeing a pattern here?



Introducing the Essential Fatty Acids (aka Percussion Instruments)

When we first defined micronutrients above, we mentioned something called essential fatty acids—or as we in the biz like to call them, EFAs. EFAs are “good fats”—fats that can save your life. They are essential for every cell in every system of your body to function properly. The EFAs in our orchestra analogy are represented by the percussion instruments. EFAs are found in both plant and animal sources, and are split into two families: omega-3 and omega-6.

As is the case with most instruments, finding a harmonious balance between omega 3 and omega 6 can be a bit tricky. Omega-3, which is chronically under-consumed in the Western diet, has a calming or anti-inflammatory effect, and has been proven to strengthen the immune system, promote brain development, improve cardiovascular function, reduce anxiety, alleviate arthritis pain, and burn excess body fat. While you may have heard about many of these health benefits, what you may not know is that these benefits are largely due to the EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) components, found only in animal-source omega-3, like fish oil, and algae.

Plant-source omega-3s, like canola oil or flax oil, do not naturally contain EPA or DHA. They contain something called ALA (alpha-linolenic acid), which can be converted within the body to EPA, which can then convert to DHA. The problem is that the body only converts ALA to EPA and then to DHA at an efficiency of approximately 5 to 10 percent and 2 to 5 percent, respectively. Animal/algae-source omega-3, on the other hand, naturally contains both EPA and DHA, so there's no conversion process necessary, and they can be directly absorbed. This means that consuming animal/algae-source omega-3s may offer greater health benefits. In contrast to omega-3, omega-6 is chronically over-consumed in the Western diet and can be found in foods like whole grains, corn, avocado, nuts, and vegetable oils, including olive oil.

Just as omega-3's ALA converts into EPA, and then into DHA, omega-6's LA (Linoleic acid) converts to GLA (gamma-linolenic acid), DGLA (dihomo-gamma-linolenic acid), AA (arachidonic acid), and finally DA (docosapentaenoic acid). While omega-3 has a calming or anti-inflammatory effect, omega-6 has a stimulating effect and tends to increase inflammation, which is essential for blood clotting, cell proliferation, and a normal immune system (GLA and DGLA are exceptions and have been shown to be anti-inflammatory). The typical Western diet can have an omega-6 to omega-3 ratio as high as 30 to 1. It is thought that a ratio closer to 1 to 1 is optimal for the promotion of health. Medical studies suggest that our excessively unbalanced ratio of omega-6 to omega-3 is a probable cause of depression and numerous diseases associated with inflammation, including Alzheimer's disease, heart disease, diabetes, cancer, and arthritis. So with the EFAs it is important to maintain a balance of omega 3 and omega 6 and to understand that just like the minerals and vitamins, omega 3 and omega 6 can't perform the others job.



Introducing the Amino Acids (aka Brass Instruments)

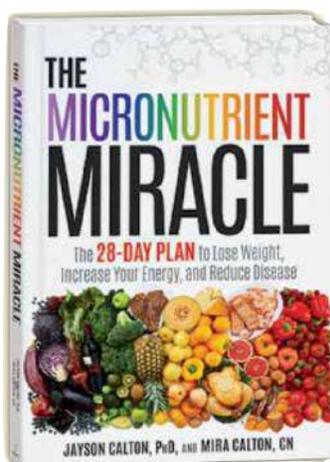
The fourth section of our orchestra is the brass section, and it represents an important class of essential micronutrients called amino acids, which act as building blocks of protein. There are 22 standard amino acids, and nine essential amino acids: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. They are called essential amino acids because our bodies cannot manufacture them, so we need to get a sufficient amount of each one every day, just like we need to get a sufficient amount of each essential vitamin, mineral, and EFA daily if we are going to achieve optimal health. Failure to get enough of even one of the essential amino acids can have serious health implications. Just like your body will rob micronutrients such as calcium from your bones when you do not get enough of it through your diet, your body will also begin to break down muscle and other protein-based structures to obtain the essential amino acids it needs when they are not obtained through your diet. And similarly to water-soluble vitamins, the body does not store excess amino acids for later use, so you must get all your essential amino acids through food or a supplement each day.

Creating a Masterpiece

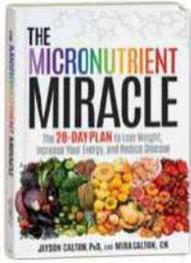
Ok, let's put everything together and see if we understand how having the right quantity and balance of each of our essential micronutrients can create a symphony of perfect health. If, for example, a piece of sheet music requires a trombone, flute, cello, and a violin, and the violin and flute are missing, it does not matter how many cellos or trombones are present at the time of performance. The music will never sound as it should. Right? Additionally, it would not matter if a tuba and a xylophone were present in their stead either, because only the violin and the flute can produce the correct sound required for the musical piece.

Likewise, if an essential bodily function requires calcium, magnesium, vitamin K, and zinc, and the calcium and zinc are deficient, then regardless of how much magnesium, vitamin K, or any other micronutrients (vitamins, minerals, EFAs, or amino acids) are present, the bodily function will never be carried out as it should be, and this will leave the door open to health conditions and diseases in the future. It all comes down to the core message we have been illustrating all along; optimal health is about having each essential micronutrient available to the body when it needs it in the right quantity and balance.

When all the essential instruments (micronutrients) are available, then the orchestra (body) can once again perform the piece of music (specific essential function) it was once unable to properly perform, and the subpar performance (health condition or disease) that was manifesting itself because of the deficiency will be greatly improved or reversed completely. This is the basis of our ***Micronutrient Sufficiency Hypothesis of Health***. In short, a deficiency in an essential micronutrient will leave the body unable to perform necessary tasks, and, over time, this can lead to a serious health condition or disease. Conversely, achieving a state of micronutrient sufficiency ensures the body has the essential micronutrients it needs to perform critical tasks and can prevent or reverse a health condition or disease being caused by a micronutrient deficiency. It makes sense right?



Our **28-Day *Micronutrient Miracle* Program** will teach you how to become sufficient in your essential micronutrients so that you can ***lose weight, increase your energy and reverse disease*** forever! [Pick up a copy today.](#)



THE MICRONUTRIENT MIRACLE

GUIDE TO:

The Woodwinds Section or Essential Vitamins



Water-soluble

Vitamin B1 (Thiamine)
Vitamin B2 (Riboflavin)
Vitamin B3 (Niacin)
Vitamin B5 (Pantothenic acid)
Vitamin B6 (Pyridoxine)
Vitamin B7 (Biotin)
Vitamin B9 (Folic acid)
Vitamin B12 (Cobalamin)
Vitamin C (Ascorbic acid)
Choline



Fat-soluble

Vitamin A
Vitamin D
Vitamin E
Vitamin K

Vitamin A

RDI:5000 IU

Why you need it?

The primary function of this fat-soluble vitamin is to preserve eyesight. Vitamin A is also essential for the formation and development of bone, teeth, and connective tissue. It also maintains the integrity of the skin and the linings of your urinary tract, lungs, and digestive system. It is required for DNA translation and both male and female reproductive processes. Vitamin A also helps fight viral infections and is thought to help fight cancer as well.

What you should know?

There are two types of vitamin A. Preformed vitamin A (also called retinoid) includes retinol, one of the most usable forms of vitamin A. This type is found only in foods of animal origin. The second type, found in plants, is called pro-vitamin A, and includes certain members of the carotenoid family, such as beta-carotene. While many people consider beta-carotene to be the same as vitamin A, it is really an inactive precursor to vitamin A, and only converts to vitamin A in the body at a rate thought to be approximately 21:1.

Where you get it?

Vitamin A

- Liver (polar bear liver contains the most with 100,000 IU per ounce!)
- Kidney
- Cod liver oil
- Butter
- Egg yolk
- Whole milk/cream
- Shrimp

Beta-Carotene

- Sweet Potatoes
- Carrots
- Winter Squash
- Dark Leafy Greens
- Romaine Lettuce
- Bok Choy



How it is destroyed in preparation?

Light and air exposure can partially deplete the vitamin A content in our foods; however, vitamin A is relatively stable when exposed to heat and is not significantly affected by cooking. In fact, chopping, puréeing and cooking carotenoid-containing vegetables can make the carotenoids (i.e. beta-carotene) more bioavailable.

What are some signs of vitamin A deficiency



- Frequent viral infections or colds
- Night blindness (nyctalopia)
- Dry eyes (xerophthalmia)
- Goose bump-like appearance of the skin known as hyperkeratosis.
- Bone deformities or poor growth in children.
- Irritability, Stress & Depression
- Hypothyroidism

Lutein

none established

Why you need it?

Lutein is a carotenoid vitamin essential for optimal eye health, but also has roles combatting as an antioxidant and possibly in combatting coronary heart disease.

What you should know?

Most multivitamins do not contain lutein at all, but our multivitamin, Nutreince, contains 6 mg of lutein because this is the amount that is recommended to prevent/reverse age-related macular degeneration (AMD)

Where you get it?

- Broccoli
- Spinach
- Kale
- Corn
- Kiwi
- Grapes
- Orange Juice
- Zucchini/Squash
- Romaine Lettuce
- Brussels Sprouts



How it is destroyed in preparation?

Lutein is depleted by both light and heat and because it is fat soluble it is better absorbed with fat than without.

What are some signs of lutein deficiency?



- There are no signs to indicate a lutein deficiency.

Vitamin B1 (Thiamine)

RDI: 1.5 mg

Why you need it?

Thiamine was the first of the B vitamins to be discovered, and it is imperative for energy production. This water-soluble vitamin is necessary for the proper functioning of the nervous system and muscles and conversion of amino acids and fatty acids into proteins, hormones, and enzymes. Thiamine can help to prevent cataracts. Deficiency can cause depression, irritability, memory loss, cardiovascular disease, and insomnia.

What you should know?

A deficiency in thiamine can cause beriberi, a potentially deadly disease that was widespread during the late 19th and early 20th century particularly in Asia.

Where you get it?

- Brewers yeast
- Lamb
- Seeds (sunflower)
- Pork
- Green peas
- Organ meats
- Fish (trout, salmon, tuna)
- Poultry
- Beans
- Asparagus
- Spinach
- Whole wheat
- Romaine lettuce
- Mushrooms
- Wheat germ
- Eggs
- Watermelon
- Nuts
- Blackstrap Molasses



How it is destroyed in preparation?

Vitamin B1 is extremely unstable and is easily damaged by heat, acid, and chemicals. The processing of grains used for cereals and breads reduces B1 content by more than half. This is because most of the vitamin B1 is found in the germ of grain, which is removed during the milling of grain. Both sulfites and nitrites, which are often used in food preservation, inactivate vitamin B1. Sulfur dioxide used as a preservative in food depletes B1.

What are some signs of vitamin B1 deficiency?



- Loss of appetite
- Sensation of “pins and needles”
- Numbness in legs
- Calf muscle soreness, tender muscles
- Depression, irritability and memory loss in elderly
- Anxiety & stress
- Cardiovascular symptoms include edema, increased pulse rate, and palpitations.
- Insomnia
- Extreme deficiency cause deficiency disease beriberi
- Eye pain
- Constipation

Vitamin B2 (Riboflavin)

RDI: 1.7 mg

Why you need it?

Vitamin B2 is essential for normal growth and development, physical performance, reproduction, lactation, and well-being. It is utilized in essential biochemical reactions, especially energy production. Like all the B vitamins, B2 is water-soluble and must be supplied daily. Additionally, it is necessary for growth and reproduction and the healthy growth of skin, hair, and nails. Riboflavin is critical for the metabolism of carbohydrates, fats, and protein. It assists with antioxidant activity and prevents oxygen-based damage. It is part of the enzyme glutathione reductase. Glutathione is a protein like “antioxidant” molecule that reduces this damage and must constantly be recycled. Vitamin B2 allows for that recycling to take place

What you should know?

The activated form of B2 is Riboflavin-5-phosphate. This is the ingredient you want to see on your supplement facts. It is the vitamin responsible for turning urine bright yellow.

Where you get it?

- Liver
- Milk
- Cheese
- Asparagus
- Meats
- Eggs
- Dark green vegetables
- Almonds
- Salmon and tuna
- Avocados
- Mushrooms
- Wheat germ



How it is destroyed in preparation?

While heat and air have no large damaging effect on B2, light is a factor. In fact, riboflavin rich foods should be stored in opaque containers, and cooked in covered pots. This includes pasta and milk, which are better purchased in boxes than see through bags and light blocking cartons rather than clear containers. Along with vitamin B1, B2 is found in the germ of grain, which is removed during the milling and processing of grain.

What are some signs of vitamin B2 deficiency?



- Migraines
- Cataracts
- Sore throat
- Depression, irritability and memory loss in elderly
- Chelosis, which is characterized by cracks in the corners of the mouth, burning lips, mouth, and tongue.
- Red eyes that tear, burn or itch and are light sensitive
- Scaly skin on face around the nose and genitalia
- Dull or oily hair
- Split nails
- Irritability, stress & depression

Vitamin B3 (Niacin & Niacinimide)

RDI: 20 mg.

Why you need it?

Vitamin B3 can be found naturally in foods or can be synthesized in humans by converting the amino acid tryptophan to niacin (vitamins B1, B6,, and iron are necessary for this conversion). It is imperative for energy production, helps to lower cholesterol, and protects against DNA damage and cancer. This water-soluble vitamin aids in the regulation of insulin and stabilization of blood sugar. Vitamin B3 protects against heart attacks, Alzheimer's disease, and cognitive decline. Niacin is part of about 200 enzymes, each of which are necessary for chemical reactions in the body to occur, which clearly shows just how important this B vitamin is to your health.

What you should know?

Most multivitamins contain only niacinamide. However, the two forms of vitamin B3 perform completely different functions in your body. Niacinamide controls blood sugar, but only niacin, a completely different form of vitamin B3 that is usually not found in multivitamins, is the form that has been shown to lower LDL (bad cholesterol) and raise HDL (good cholesterol). Nutreince, our reinvention of the multivitamin, contains both forms because when we say complete, we mean it.

Where you get it?

- Fish (tuna, salmon, mackerel)
- Organ meats
- Poultry
- Beef
- Eggs
- Yeast
- Peanuts
- Legumes
- Crimini mushrooms
- Whole wheat



How it is destroyed in preparation?

Great News! Heat, air, and light have little damaging effect on vitamin B3.

What are some signs of vitamin B3 deficiency?



- Dermatitis- dry patchy scaly skin.
 - Digestive problems including swollen tongue
 - Muscular weakness
 - Mental confusion and delirium in advanced deficiencies.
 - Lack of energy
 - Insomnia
 - Migraines
 - Irritability
 - Anxiety
 - Depression
- Pellagra- A severe deficiency of B3 is known as pellagra which means rough skin. It is characterized by the four D's – dermatitis, dementia, diarrhea, and death. It is common in areas where corn is the main food staple.

Vitamin B5 (Pantothenic Acid)

RDI: 10 mg

Why you need it?

Once absorbed, pantothenic acid is converted into co-enzyme A (CoA), which is the only known biologically active form of vitamin B5. CoA is required for the chemical reactions that generate energy from food (carbohydrates, fats, and proteins) and in the synthesis of the essential fats, steroid hormones, cholesterol, the neurotransmitter acetylcholine, and the hormone melatonin. It controls fat metabolism, is essential for the brain and nerves, and helps to maintain healthy skin and hair. This water-soluble vitamin helps to fight stress by keeping the adrenal glands functioning properly and aids in the detoxification of alcohol.

What you should know?

D-calcium pantothenate is the natural form of pantothenic acid and is the most commonly used supplemental form of this vitamin. It is more stable than free pantothenic acid and is well absorbed in the digestive tract.

Where you get it?

- Avocado
- Yogurt
- Liver
- Chicken
- Fish (trout, salmon)
- Sunflower Seeds
- Shiitake Mushrooms
- Legumes
- Sweet Potato
- Broccoli
- Whole Eggs



How it is destroyed in preparation?

Cooking, freezing and commercial processing can significantly deplete Pantothenic acid. Frozen foods, and canned foods and fruit juices all show depletion ranges from 7-70%.

What are some signs of vitamin B5 deficiency?



- Fatigue
- Sensations of weakness
- Numbness, tingling or burning sensations in the feet.
- Acne
- Muscle tremors or spasms
- Teeth grinding
- Anxiety or tension
- Irritability
- Depression

Vitamin B6 (Pyridoxal 5 Phosphate)

RDI: 2 mg

Why you need it?

Vitamin B6 is part of more than 100 enzyme reactions. Many of the activities of vitamin B6 are related to the metabolism of amino acids and other proteins, including hemoglobin, serotonin, hormones, and prostaglandins. This water-soluble vitamin is also essential for brain function and helps to balance sex hormones. Moreover, it is a natural diuretic and antidepressant and may decrease the risk of colon cancer. It promotes the breakdown of sugar and starches. It is key for heart health because vitamin B6 works alongside vitamin B9 (folate) and vitamin B12 to keep blood levels of homocysteine, an amino acid, within a normal range. It supports your nervous system. The production of neurotransmitters that foster communication between nerve cells is made possible by a compound that contains vitamin B6. It reduces inflammation that can cause type 2 diabetes, cardiovascular disease, and obesity. Those individuals with inflammation actually need more vitamin B6.

What you should know?

The bioactive form of Vitamin B6 is Pyridoxal 5 Phosphate. However, many inferior multivitamin products utilize Pyridoxine HCL, which is not the active form of this B vitamin.

Where you get it?

- Wheat Germ
- Liver
- Peanuts
- Legumes
- Pork
- Bananas
- Yellowfin Tuna
- Salmon
- Poultry
- Potatoes with skin on



How it is destroyed in preparation?

Large amounts of vitamin B are lost during most forms of cooking and processing. Approximately 38% of B6 is lost from canning of fruits, 15% from freezing of fruits, 70% from the canning of vegetables, and up to 75% in the conversion of fresh meat into meat by-products. In general, the more acidic a food, the more B6 is lost during cooking.

What are some signs of vitamin B6 deficiency?



- Depression & Anxiety
- Sleep disturbances
- Nerve inflammation
- PMS
- Nausea & vomiting
- Convulsions or seizures
- Skin disorders including eczema
- Lethargy
- Anemia
- Altered mobility
- Elevated homocysteine
- Infrequent dream recall
- Water retention

Vitamin B7 (Biotin)

RDI: 300 mcg

Why you need it?

Biotin is essential for the activity of many enzyme systems. It aids in the metabolism of fat and sugar and converts sugar to its usable chemical energy. Biotin is also required for an enzyme called CoA carboxylase to put together the building blocks for the production of fat in the body. Fat, a part of every cell membrane, aids in separating the inner workings of cells from their environment. This is especially important for cells that must be rapidly replaced, such as skin cells.

What you should know?

Avidin, a protein found in egg whites, can bind with biotin and prevent its absorption. However, thoroughly cooking the egg whites denatures avidin, allowing body to absorb biotin.

Where you get it?

- Liver
- Milk
- Egg Yolk
- Yeast
- Pork
- Salmon
- Avocado
- Cheddar Cheese
- Peanuts
- Swiss Chard
- Cauliflower
- Almonds



How it is destroyed in preparation?

Great news! Biotin is fairly stable when exposed to heat, light and oxygen.

What are some signs of vitamin B7 deficiency?



- Hair loss
- Loss of hair color
- Depression
- Scaly dermatitis
- Lesions on the nose and mouth
- Anorexia
- Numbness and tingling of the extremities
- Nausea
- Muscle pain
- Cardiac irregularities.
- Seizures
- Poor muscle tone
- Anxiety & stress

Vitamin B9 (Folate)

RDI: 400 mcg

Why you need it?

Folate is often publicized for its importance in pregnancy to prevent neural tube defects (spina bifida). It has been shown that mothers with folate deficiency give birth to a greater number of infants with neural tube defects. Additionally, it also works with vitamins B6 and B12 to lower homocysteine levels. Deficiency in folate can lead to megaloblastic anemia, but it is important to note that megaloblastic anemia caused by a folate deficiency is identical to the anemia caused by a vitamin B12 deficiency, making a B12 deficiency hard to identify. B9, a water-soluble vitamin, also reduces dementia and Alzheimer's, prevents bone fractures and aids in healthy circulation. One of folate's most important duties is cell reproduction. B9 is necessary for making the nucleic acids DNA and RNA, which act as instruction manuals for your cells.

What you should know?

Research published in the American Journal of Epidemiology shows that more than 34% of the U.S. population may have a genetic enzyme defect known as MTHFR mutation that makes it difficult for them to convert folic acid into biologically active L-5-MTHF, and new estimates suggest that up to 60% of the population may be affected. For these individuals and many others, L-5-MTHF may be a more effective method of folate supplementation. nutreince is one of the only multivitamins to contain the full RDI of 400 mcg of L-5-MTHF.

Where you get it?

- Romaine Lettuce
- Spinach
- Asparagus
- Liver
- Beans (Garbanzo)
- Lentils
- Broccoli
- Whole Grain - Wheat Germ
- Eggs



How it is destroyed in preparation?

Plants (like spinach) can lose up to 40% of their folate content from cooking, while folic acid in meat is far more stable when cooked. Despite the fact that processing of grains causes up to 70% of folic acid to be depleted, folic acid is not one of the micronutrients that is enriched in these products.

What are some signs of vitamin B9 deficiency?



- Irritability
- Mental fatigue and forgetfulness
- Depression & Anxiety
- Fatigue
- Hair loss
- Gingivitis
- Cleft palate
- Periodontal disease
- Vitiligo (loss of skin pigmentation)
- Dry skin

Vitamin B12 (Cobalamin)

RDI: 6 mcg

Why you need it?

Vitamin B12 works with folate (B6) and vitamin B6 to regulate elevated homocysteine levels, a risk factor for cardiovascular disease. This water-soluble vitamin is also an essential growth factor and plays a role in the metabolism of cells. B12 helps to maintain the nervous system in that it is required for the synthesis of myelin, the insulation around nerves. Moreover, deficient levels of B12 are also thought to play a role in Alzheimer's disease and depression. Vitamin B12 is naturally available only in animal products. Gastric acid in the stomach is needed to properly separate B12 from our food and create free form B12, which can then be absorbed (supplemental B12 is already in its free form so it does not require gastric acid). However, proper B12 absorption is dependent on its binding with a protein made in the stomach called intrinsic factor, which helps B12 make its way from the gastrointestinal tract—the stomach and intestines—into the rest of the body. Without intrinsic factor, vitamin B12 cannot gain access to the rest of the body where it is needed. People who do not eat animal foods and who don't consume the suggested amount of vitamin B12 from dietary supplements are prone to vitamin B12 deficiency. Additionally, as you age, the risk of inadequate vitamin B12 absorption rises. A deficiency can cause pernicious anemia, a condition in which red blood cells fail to develop properly. B12 is also unique among water-soluble vitamins in that a relatively large amount can be stored in the liver.

What you should know?

The standard source of B12, cyanocobalamin, is not a natural source. In fact, it's not found anywhere in nature and must be converted by the liver into methylcobalamin in order to be utilized in humans (and all other animals). Cyanocobalamin is typically found in inexpensive products offered in grocery stores. Methylcobalamin is the form of vitamin B12 active in the central nervous system. It is essential for cell growth and replication.

Where you get it?

- Clams
- Mussels
- Crab
- Salmon
- Snapper
- Liver
- Oysters
- Venison
- Shrimp
- Scallops
- Beef
- Cheese



How it is destroyed in preparation?

B12 in animal foods is well preserved during cooking. Approximately 70% of this vitamin remains after heating animal foods for a period of about 30 minutes.

What are some signs of vitamin B12 deficiency?



- Dandruff
- Nervousness/Anxiety
- Decreased blood clotting
- Numbness or tingling in feet
- Decreased reflexes
- Paleness
- Depression
- Red or sore tongue
- Difficulty swallowing
- Fatigue/Weakness
- Heart palpitations
- Memory problems
- Weak pulse
- Menstrual problems

Choline

425 mg

Why you need it?

Choline assists vitamin B6 and folate in the methylation process, which helps with building DNA, exchanging signals in the brain and detoxification processes in the liver. It is also essential in producing phosphatidylcholine: a key structural building block to every cell in the body. Moreover, it provides the backbone to the neurotransmitter acetylcholine, which provides the signal to keep the heart, intestines and muscles moving, amongst other things.

What you should know?

While the research is still evolving, a daily intake of 425 mg is a safe daily reference point for dietary intake of choline.

Where you get it?

- Shrimp
- Eggs
- Scallops
- Chicken
- Turkey
- Tuna
- Cod
- Salmon
- Beef
- Collard Greens



How it is destroyed in preparation?

Great news!! Choline appears to be a fairly stable nutrient to heat and storage.

What are some signs of iodine deficiency?



- Difficulty Focusing
- Memory Problems
- Lack of Energy
- Persistent Brain Fog
- Anxiety

Vitamin C

RDI: 60 mg.

Why you need it?

Vitamin C is so critical to living creatures that almost all mammals can make it with in their own bodies. However, humans—along with gorillas, chimpanzees, bats, birds, and guinea pigs—are among the few species that cannot make vitamin C. Optimal doses of vitamin C have been associated with the improvement of many health conditions, including cardiovascular diseases, cancers, joint diseases, cataracts, and the common cold. It is also the cure for scurvy, for which it was first discovered. This water-soluble vitamin plays a role in collagen and elastin synthesis, both necessary elements in bone matrix, skin, tooth dentin, blood vessels, and tendons. This powerful antioxidant helps to protect against oxygen-based damage to our cells (free-radicals). It is required for fat synthesis and because of its antiviral and detoxifying properties, it can even help to heal wounds.

What you should know?

Science has shown us that more is not always better when it comes to the amount of vitamin C one should be taking if they are currently taking a statin drug. The anti-inflammatory effect of cholesterol lowering statin drugs can be inhibited by taking megadoses of vitamin C (more than 200 mg). A multivitamin should not contain more than 200 mg of vitamin C to be within the safe range for statin takers. While vitamin C has not been proven to cause kidney stones, in some individuals its metabolic pathway produces high amounts of oxalic acid, which could lead to calcium oxalate stones. Therefore, people with a history of gout, kidney stones, or kidney disease should not take more than 500 mg of vitamin C daily without medical supervision.

Where you get it?

- Yellow Bell Peppers
- Strawberries
- Oranges (and Juice)
- Grapefruit (and Juice)
- Limes
- Broccoli
- Liver (Beef, Calf, Pork, Chicken)
- Oysters
- Kale
- Snow Peas
- Cauliflower
- Watermelon
- Cabbage
- White Potato



How it is destroyed in preparation?

Vitamin C is highly sensitive to light, air and heat, so you'll get the most vitamin C if you eat fruits and vegetables raw or lightly cooked. Approximately, 25% of vitamin C is lost during the blanching (prior to freezing), boiling, or thawing processes. Cooking for about 20 minutes can cause over half of this vitamin to be destroyed. Reheated canned vegetables only contain a third of the original vitamin C content.

What are some signs of vitamin C deficiency?



- Inability to heal wounds
- Frequent infections, colds or flu
- Lung-related problems
- Easy bruising
- Tender swollen joints
- Lack of energy
- Bleeding gums/ Tooth decay
- Nosebleeds
- Anxiety and stress

Vitamin D

RDI: 400 IU

Why you need it?

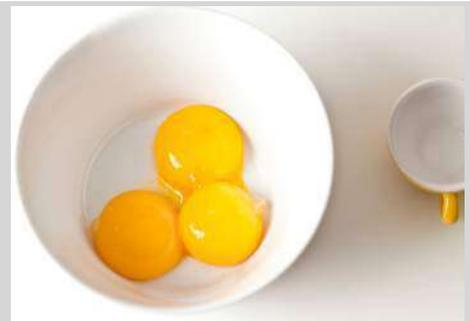
Vitamin D is unique in that it is the only vitamin that can be made when our skin comes into contact with strong ultraviolet B rays from the sun. Because of this, vitamin D is also known as the “sunshine vitamin.” In fact, this fat-soluble vitamin is actually a hormone triggered by sunlight called calcitrol, 1,25-dihydroxy vitamin D3. This vitamin was first discovered as a cure to help prevent the bone development disease, rickets, in children. Vitamin D helps regulate our metabolism, bone and teeth development, muscle function, immune function, insulin activity, calcium balance, and phosphorous balance. It is imperative for maintaining cognitive function and cancer prevention and aids in the reduction of inflammation. It is imperative for healthy heart function. Due to a major micronutrient synergy, without enough vitamin D circulating in your bloodstream, it’s impossible to absorb all the calcium you need.

What you should know?

There are two forms of vitamin D available in supplemental form: vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). D3 is the form that is produced in our skin when we are exposed to sunlight. It is more biologically active and superior for supplementation. In fact, supplementation with D2 has shown a reduction in serum vitamin D levels rather than an increase.

Where you get it?

- Egg Yolks
- Liver (Fish, Beef)
- Salmon, Herring, Sardines (wild caught fish are higher in D)
- Shiitake Mushrooms
- Oysters



How it is destroyed in preparation?

Vitamin D is fairly stable, approximately 1/4 of the D content will be lost when cooked at temperatures above 400°F or 200°C.

What are some signs of vitamin D deficiency?



- Muscle weakness, pain or twitching
- Frequent fall in elderly or stunted growth in children
- Asthma
- Lowered immunity
- Depression
- Autoimmune disorders
- Hearing loss due to loss of bone in the middle ear
- Pale skin
- Obesity
- Arthritis
- Tooth decay
- Anxiety
- Thyroid dysfunction

Vitamin E (Tocopherol/Tocotrienol)

RDI: 30 IU

Why you need it?

Vitamin E is a powerful antioxidant shown to help repair muscle tissue. Recent research on muscle cells indicates that one of vitamin E's main functions is its antioxidant repair mechanism, which aids in repair of cell membranes that have been compromised. This new finding may have implications for enhanced athletic performance as well as with genetic muscle-wasting diseases such as muscular dystrophies or amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease. As a powerful antioxidant, this fat-soluble vitamin prevents cell damage from free radicals. This is important for heart health as it decreases platelet adhesion and prevents LDL cholesterol from being oxidized. It promotes healthy skin by protecting the skin from ultraviolet radiation (UV light). Vitamin E can also prevent the oxidation of the fatty portion of the cell membranes in the lens of your eye, which protects against AMD and cataracts.

What you should know?

Vitamin E is split into two families the tocopherols and the tocotrienols, each containing four unique derivatives (alpha, beta, gamma, and delta). Smart supplements (like our patented multivitamin, Nutreince) contain the full spectrum of each. Additionally, you should search for a natural source of mixed tocopherols (vitamin E) not a synthetic source of alpha-tocopherol (just one of four tocopherols). According to research published in the American Journal of Clinical Nutrition researchers found that levels of natural vitamin E (d-tocopherol) in the blood and in the organs were double that of synthetic vitamin E (dl-tocopherol) when compared, showing natural vitamin E is better retained and more biologically active than synthetic. Finally, for those taking a statin it has been recommended to keep daily vitamin E intake to 100 IU or less as both vitamin E and vitamin C have been shown to inhibit the anti-inflammatory effects of statins.

Where you get it?

- Almonds/Hazelnuts/Peanuts/Sunflower Seeds
- Sunflower, Safflower and Olive Oils
- Mustard Greens/Chard/Kale
- Chili peppers
- Wheat germ
- Avocado
- Papaya
- Spinach
- Sweet Potato



How it is destroyed in preparation?

Vitamin E is greatly depleted by factory processing. In the wheat flour that is used to make 90% of all bread and pasta sold in the US, nearly 90% of the vitamin E (alpha tocopherol) and 43% of the beta tocopherols have been removed. This is because the majority of the vitamin E in wheat is found in the germ, which is removed during commercial processing. To protect vitamin E in oils make sure they are kept in airtight containers. High temperature cooking is also quite destructive.

What are some signs of vitamin E deficiency?



- Liver and gallbladder problems
- Easy bruising
- Thyroid dysfunction/Hypothyroid
- PMS/Hot flashes
- Eczema/Psoriasis
- Poor wound healing
- Tingling in extremities
- Sterility
- Anxiety
- Dry Skin

Vitamin K (Quinones)

RDI: 80 mcg

Why you need it?

Vitamin K has an anti-hemorrhagic factor and is essential for proper blood clotting or coagulation. In fact, the “K” in vitamin K is derived from the German word koagulation, which means “coagulation” in English. Most dietary vitamin K comes in the form of vitamin K1 from plant foods, but the bacteria in our intestines can convert this from K1 to K2. Unfortunately, new research shows that this contribution may be less than previously thought. It also supports bone health in that this fat-soluble vitamin activates the conversion of a bone-building protein called osteocalcin, which shores up bone tissue by binding the minerals that support bone strength.

What you should know?

Vitamin K is all too often omitted from many multivitamin formulations, but is essential for bone strength and heart health. It is important for a supplement to include both K1 and K2 and even more superior and rare if it also includes both forms of vitamin K2 (MK-4 and MK-7). While vitamin K1 plays a role in blood clotting, K2 is a more important inducer of bone mineralization in human osteoblasts (bone-building cells). Vitamin K2 has been proven in studies to be as effective as prescription drugs in reducing the incidence of bone fractures. Additionally, because K2 directs the calcium out of the arteries and into the bones where it is needed, K2 is essential for the prevention of coronary heart disease.

Where you get it?

- Natto (Fermented Soy Dish popular in Japan) 1,103 mcg K2 per 3.5 oz
- Goose Liver 369 mcg per 3.5 oz
- Gouda Cheese 75 mcg per 3.5 oz
- Sauerkraut
- Egg Yolk
- Butter (from 100% Grass-Fed Cows)
- Ground Beef
- Kale, raw
- Broccoli
- Spinach
- Liver
- Brussels Sprouts
- Asparagus
- Green Beans/Peas
- Cauliflower
- Milk (from 100% Grass-Fed Cows)



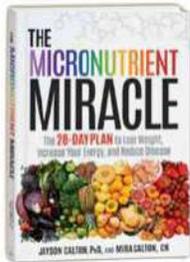
How it is destroyed in preparation?

Foods become higher in vitamin K1 when they have less water. For example, tomato paste is higher than tomatoes. Also, the outer leaves of the green leafy vegetables are more nutrient rich in K1 than the inner leaves. When fruits or vegetables are commercially processed into juice vitamin K1 is depleted. Alkalis, strong acids, radiation, and oxidizing agents can destroy vitamin K. Anticoagulant medications (like warfarin, an anticoagulant widely sold under the brand name Coumadin) interfere with vitamin K metabolism. Those taking these prescription drugs still require vitamin K, however, in order to decrease the risk of unwanted blood clots one should inform their physician that they plan on supplementing with vitamin K so that their physician can adjust the dose appropriately.

What are some signs of vitamin K deficiency?



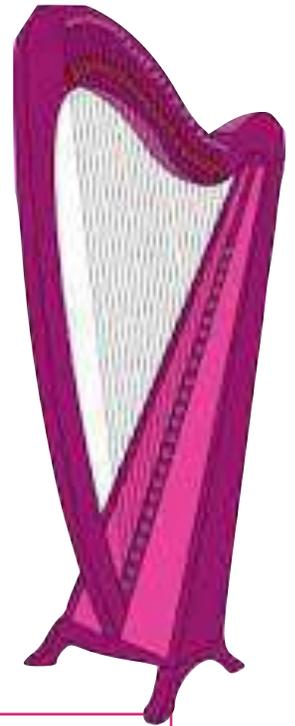
- Osteoporosis
- Heavy Bleeding (menstrual, nose bleeds or gum bleeding)
- Hardened arteries
- People with serious burns
- Liver disease
- Celiac disease
- Cystic fibrosis
- Crohn's disease
- Cancer
- Type 2 Diabetes



THE MICRONUTRIENT MIRACLE

GUIDE TO:

The Strings Section or Essential Minerals



Macrominerals

Calcium
Chloride
Magnesium
Phosphorus
Potassium
Sodium

Trace Minerals

Boron
Chromium
Copper
Iodine
Iron
Manganese
Molybdenum
Selenium
Silica
Zinc

Boron

none established

Why you need it?

Recent research indicates that boron may play a role in metabolism, bone health, immune response and cognitive function. In humans, bones and dental enamel contain the highest concentrations of boron. Boron aids in the conversion of vitamin D into its active form that promotes calcium absorption and deposition in bones. This mineral has been shown to reduce the symptoms of rheumatoid arthritis.

What you should know?

While boron is a trace mineral known to be essential to plants for over 100 years, it has only recently been recognized for its effects on humans. As such, there is no reference daily intake (RDI) established for boron in humans.

Where you get it?

- Dried apricots and raisins
- Avocado
- Nuts (almonds, hazelnuts, brazil nuts)
- Wine (shiraz, cabernet)



How it is destroyed in preparation?

Great News! Heat, air, and light have no known effect on Boron.

What are some signs of boron deficiency?



- Arthritis
- Osteoporosis

Calcium

RDI: 1000 mg

Why you need it?

Calcium is the most abundant mineral in the human body, making up 1.5% of total body weight. About 99% of calcium is found in the bones and teeth, with the remaining 1% found in cells and body fluids. A calcium deficiency is one of the causative factors of osteoporosis; a disease characterized by brittle and porous bone that affects more than 20 million Americans. Additionally, studies have shown that a sufficiency in calcium may reduce the risk of colon cancer and prevent or treat moderate hypertension. It is also required for muscle contraction, blood clotting, and nerve transmission.

What you should know?

Choose a supplement that delivers the maximum amount of calcium that can be absorbed by the body at one time (500- 600mg). This is the only micronutrient that should be less than 100% RDI. While pills and capsules should utilize calcium citrate as it is more absorbable, liquids and powders have an extra advantage. Combining calcium carbonate with non-GMO citric acid stimulates the conversion of the calcium carbonate to calcium citrate in water. Thus supplying the best absorption in a liquid form. Additionally, while media has reported that calcium should not be supplemented because it causes calcification of the arteries, the truth is that it is essential to the human body. This calcification can be completely eliminated by making sure that supplements also contain vitamin K2 so that it can direct the calcium into the bones where it belongs.

Where you get it?

- Milk/Dairy Products
- Sardines
- Sesame Seeds
- Broccoli
- Legumes
- Canned (bone-in) Salmon
- Bone Broth (minimal)
- Green Leafy Vegetables



How it is destroyed in preparation?

Great News! Cooking and storing do not have an adverse effect on Calcium.

What are some signs of calcium deficiency?



- Osteoporosis or rickets
- Bone pain or fractures
- Muscle pain
- Numbness or tingling in extremities
- Growth retardation in children
- Insomnia
- High blood pressure
- Tooth decay
- Sugar Cravings
- PMS
- Anxiety and stress

Chromium

AI: 120 mcg

Why you need it?

Chromium plays important role in the regulation of blood sugar levels, the enhancement of insulin effectiveness and the activation of various enzymes for energy production. It also seems to help lower elevated serum cholesterol and triglycerides.

What you should know?

Research has suggested that chromium picolinate may be linked to causing DNA damage. While the jury is still out, the safest, most absorbable form of chromium is chromium polynicotinate - a pure niacin-bound form of chromium, identified by U.S. government researchers as the active component of true GTF (Glucose Tolerance Factor) - which regulates the bodies use of glucose and helps balance blood sugar levels. This is an extremely important micronutrient for those with diabetes. According to Dr. Walter Mertz, M.D. former director of the USDA Human Nutrition Research Center, "Type II Diabetes is not a disease. It is the lack of a natural ingredient known as GTF Chromium."

- Broccoli
- Onions
- Tomatoes
- Whole Grains - Wheat Germ
- Romaine Lettuce
- Lean Meats
- Cheese
- Legumes
- Nuts



Where you get it?

How it is destroyed in preparation?

Chromium is found in the germ and bran of whole wheat and is usually removed when processed. Chromium also naturally found in sugar cane, but it is removed during the process of making sugar.

What are some signs of chromium deficiency?



- Impaired glucose tolerance.
- Diabetes
- Cardiovascular disease
- High Cholesterol
- High blood pressure
- Cold hands
- Decreased Fertility
- Need for frequent meals
- Cold sweats
- Metabolic Syndrome
- Depression & Anxiety
- Obesity

Copper

RDI: 2 mg

Why you need it?

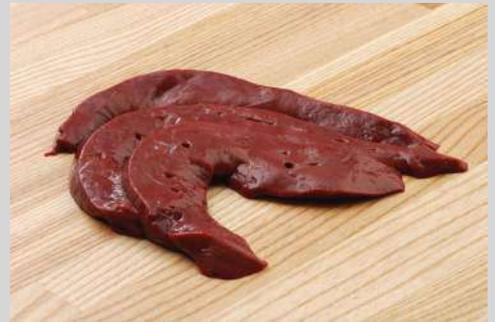
Copper is essential trace mineral that plays an important role in metabolism and is critical functional component in a number of essential enzymes, known as cuproenzymes. It becomes incorporated into liver enzymes, which are then secreted into the blood as ceruloplasmin - a copper-carrying protein and important blood-based antioxidant. Another important role is in oxidation-reduction (redox) reactions, whereby it has an ability to scavenge free radicals. Copper is present in every tissue of the body, with the highest concentrations stored in the liver. It is also required for the formation of the connective tissue that helps support the heart, blood vessels, skin, and bones. Copper is important for the utilization of iron, so iron deficiency anemia may be a sign of a copper deficiency.

What you should know?

Taking a multivitamin with copper is generally not recommended because too much copper in the body can hinder your body's ability to destroy the proteins that form the plaques found in the brain of Alzheimer's patients. Many Alzheimer's patients have been found to have elevated levels of copper, and in studies, it was determined that many of those effected took multivitamins with copper. Additionally, pregnant woman should avoid copper in multivitamins because copper levels can nearly double during pregnancy making toxicity a concern. Cramps, abdominal pain, vomiting, nausea, and diarrhea are all common when taking supplements that include copper.

Where you get it?

- Beef Liver/Organ Meats
- Oysters/Clams/Crab/lobster
- Nuts
- Lentils
- Mushrooms
- Green Leafy Vegetables
- Whole Grain Breads & Cereals
- Chocolate
- Sesame/Sunflower Seeds



How it is destroyed in preparation?

Long periods of heat can greatly deteriorate copper levels in foods. The processing of grain produces copper content by about 70%.

What are some signs of copper deficiency?



- Anemia
- Fatigue
- Loss of color in the hair and skin (due to decreased synthesis of melanin)
- Low body temperature
- Nervous system disorders
- Blood vessels that rupture easily
- Skin sores
- Elevated LDL cholesterol
- Osteoporosis
- Elevated copper leads to anxiety

Iodine

RDI: 150 mcg

Why you need it?

Iodine's main function is the synthesis of thyroid hormones, (T4) thyroxine and (T3) triiodothyronine, and is essential for normal thyroid function. Cells in the thyroid, a small gland located in the front of the neck just under the voice box, are the only cells capable of absorbing iodine. Thyroid cells capture iodine and combine it with an amino acid, tyrosine, to produce thyroid hormones that are then released into the bloodstream. A deficiency of dietary iodine causes the thyroid to become unable to make thyroid hormones, which control a variety of biological and physiological activities including body temperature, physical growth, reproduction, neuromuscular function, the synthesis of proteins, and the growth of skin and hair. In some cases of iodine deficiency, the thyroid will enlarge (this is known as a goiter). If the thyroid gland is absent or damaged, and individuals basal metabolic rate (BMR) can decline to as low as 55% of its normal rate, resulting in impaired growth and development; conversely, if the thyroid gland is hyperactive, and individuals BMR can go up to as high as 160%, causing tachycardia, nervousness, and excitability.

What you should know?

Iodine can have a normalizing effect on the thyroid gland, meaning thin people with thyroid trouble, due to iodine deficiency, can gain weight and obese people can lose weight simply by becoming sufficient in iodine. Many people with low salt diets can fall short in this mineral, as iodized table salt is the primary source of iodine in the U.S. diet. Kelp, or supplements containing kelp are an excellent natural source of iodine.

Where you get it?

- Seaweed
- Iodized salt
- Cod
- Seafood
- Milk
- Yogurt
- Eggs
- Potato (with Peel)
- Turkey
- Navy Beans
- Strawberries



How it is destroyed in preparation?

Iodine does not lose potency in preparation or cooking. Instead, it is added into many processed foods in the form of iodized table salt

What are some signs of iodine deficiency?



- Goiter
- Depression
- Hypothyroid/Hashimotos
- Weakness/Fatigue
- Weight gain

Iron

RDI: 18 mg

Why you need it?

Iron is an essential micronutrient that is found in every cell in the human body. The primary functions of iron include oxygen transport within blood and muscle, and the conversion of blood sugar into energy. About 70% of the iron in the body is stored in the blood in the form of hemoglobin. Dietary iron is found in two forms: heme iron and non-heme iron; however, heme iron is primarily found in animal sources and has an absorption rate of ~30% compared to the ~3% rate absorbed from non-heme iron. Vitamin C can enhance the absorption of iron, particularly of non-heme iron. A deficiency in iron leads to the inability of the red blood cells to carry oxygen needed by the cells; when this happens, anemia may result. This mineral is needed for optimal immunity and aids in fatty acid metabolism as well as liver detoxification.

What you should know?

Iron is a vital mineral your body needs to function normally. However, the National Institutes of Health's Office of Dietary Supplements, has indicated that too much iron can cause serious health complications. Because of this, you may want to take an iron-free multivitamin to avoid iron overload, a medical condition that causes excess iron to be stored in vital organs such as the liver and heart. Too much iron may be toxic—and even fatal. In general, iron supplementation is not recommended for adult males and postmenopausal women. If you are a child, teen, pre-menopausal woman, an athlete that works out for more than 6 hours a week, or a strict vegan/vegetarian you may want to consider iron supplementation. Additionally, iron is an extremely competitive nutrient, having competitions with 10 other vitamins and minerals. Because of this iron should always be taken away from one's multivitamin.

Where you get it?

- Liver
- Oysters, Mussels
- Beef/Fish/Poultry
- Kidney Beans/Lentils
- Dried Fruits (Prunes/Raisins)
- Potato, with Skin
- Cashew Nuts
- Black-Strap Molasses
- Tofu



How it is destroyed in preparation?

Refining and processing of grain removes about 75% of the iron. However, some is added back in through fortification, but this type is less absorbable. While many people believe that spinach is a good form of iron, the oxalic acid in raw spinach depletes the availability by as much as 97%.

What are some signs of Iron deficiency?



- Weakness/Fatigue
- Headaches
- Brittle nails
- Anxiety & Depression
- Poor immune system
- Inability to concentrate
- Pale skin
- Thyroid dysfunction

Magnesium

RDI: 400 mg

Why you need it?

Magnesium is involved in over 300 essential metabolic reactions in the body and is necessary for the transmission of muscular activity, nerve impulses, temperature regulation, blood pressure regulation, detoxification reactions, and for the formation of healthy bones and teeth. It is also involved in the synthesis of DNA and RNA and in energy production. Deficiency in magnesium can compromise cellular activity, especially in the tissues of the heart, kidneys and nerves. In our bodies, the majority of magnesium is found mostly in our bones (~60-65%) and muscles (25%), but as with all minerals, it cannot be made in our body and thus needs to be plentiful in the diet in order for us to remain healthy. Moreover, a magnesium deficiency can cause a sugar craving.

What you should know?

Most multivitamins supply small amounts of magnesium because of its bulky size. Locate supplements that supply 400 mg of magnesium, a micronutrient responsible for over 300 essential metabolic reactions in the body as well as controlling sugar cravings. Similarly to calcium carbonate, in water, the magnesium carbonate is converted to magnesium citrate, one of the most bioavailable forms, through ionic conversion utilizing non-GMO citric acid.

Where you get it?

- 100% Bran Cereal
- Oat Bran
- Brown Rice
- Nuts/Seeds
- Legumes
- Dark Leafy Vegetables
- Broccoli
- Potato Skin
- Banana
- Milk/Cheese
- Fish/Shellfish



How it is destroyed in preparation?

Blanching, steaming and boiling can cause a major completion of magnesium. For example, spinach loses 1/3 of the magnesium when blanched, and beans can lose up to 65%. Processing of grain causes major magnesium depletion. Approximately 85% is lost when white flour is produced.

What are some signs of magnesium deficiency?



- Weakness
- Muscle cramps
- Loss of appetite
- GI disorders
- Fear & irritability
- High blood pressure
- Anxiety & Depression
- Insomnia
- Increased heart rate
- Imbalanced blood sugar levels

Manganese

RDI: 2 mg

Why you need it?

Manganese is a cofactor that aids in the activation of a wide variety of enzymes; these enzymes influence many biological activities, including the synthesis of collagen and the maintenance of connective tissue and cartilage, metabolism of amino acids, fats, carbohydrates, and cholesterol, regulation of blood clotting, bone development and antioxidant function. A deficiency in manganese has been shown to result in poor growth and impaired reproduction in animals and may be related in some way to osteoporosis, diabetes mellitus and seizure disorders in humans.

What you should know?

The name manganese comes from the Greek word for magic, which still is appropriate today in that science is still working to understand the balance between manganese potential for toxicity (when inhaled or in large dosages) and the health consequences of its deficiency.

Where you get it?

- Nuts/Seeds
- Dried Beans
- Cereal Grains
- Pineapple
- Green Tea
- Green Leafy Vegetables
- Cinnamon
- Berries



How it is destroyed in preparation?

Manganese is significantly lost due to the processing of whole grains to produce white flour. Approximately 60% of the manganese in beans is lost when cooked, proving manganese to be susceptible to heat.

What are some signs of manganese deficiency?



- Deficiency is rare because magnesium is capable of substituting for many of manganese's enzyme-related functions.
- Skeleton abnormalities
- Weak ligaments
- Hearing loss
- Skin rash
- Vomiting and nausea
- Low cholesterol
- Inferior reproductive system

Molybdenum

RDI: 75 mcg

Why you need it?

Molybdenum is one of the rarest substances on earth, yet small amounts of this mineral are found in all tissues of the human body. This mineral assists a small number of enzymes, the most important is sulfite oxidase, which is involved in the metabolism of sulfur containing amino acids.

What you should know?

Plants require molybdenum to convert nitrates from soil to amino acids. When soil content is low in molybdenum, plants convert the nitrates into nitrosamines (known carcinogens). This may explain increased rates of esophageal and stomach cancer and area is known for low molybdenum soil content.

Where you get it?

- Wheat Germ
- Organ Meats
- Green Leafy Vegetables
- Legumes
- Nuts
- Whole Grain



How it is destroyed in preparation?

Food processing which removes the germ destroys nearly 50% of molybdenum.

What are some signs of molybdenum deficiency?



- Deficiency is rare because so little is needed by the body.
- There exists a rare genetic deficiency condition that causes unexplained seizures called molybdenum cofactor deficiency syndrome.
- Although molybdenum deficiencies are rare, individuals with a genetic defect that prevents the formation of sulfite oxidase are at high risk.

Phosphorus

RDI: 1000 mg

Why you need it?

Phosphorus is the second most abundant mineral in the human body, behind calcium, but participates in more biological processes than any other mineral. It is required for the normal function and metabolism of every cell in the body, with ~85% found in the skeleton and 15% in the rest of the cells of the body. This essential mineral is part of cell membranes and participates in the inner workings of cells as part of the nucleic acids DNA and RNA that store and transmit genetic information. It is a major structural component on cell membrane, which helps to regulate what moves in and out of cells. It also lends strength to bones and teeth and it is integral to the structure of soft tissue. It is essential for muscle contraction, nerve cell communication, regular heartbeat, as well as the balance between acidity and alkalinity in the blood.

What you should know?

While most nutritionists recommend a balance of calcium and phosphorous, the typical Western diet contains roughly 2-4 times more phosphorous than calcium. Meat and poultry contain 10-20x as much phosphorous as calcium and carbonated beverages such as colas have as much as 500mg in ONE serving!! When there is more phosphorus than calcium in the body, the body will use calcium stored in bones to balance things out. This is how phosphoric acid in soda can leach bones of calcium causing osteoporosis.

Where you get it?

- Yogurt
- Animal Protein
- Soft Drink
- Nuts/Seeds/Lentils - Phosphorous in these foods is about 50% less bioavailable due to the fact it is in the form of a phytates or phytic acid



How it is destroyed in preparation?

It is unknown the effects of preparation.

What are some signs of phosphorus deficiency?



- Deficiency is rare
- Confusion
- Decreased immune system
- Bone pain

Potassium

AI: 4700 mg

Why you need it?

Along with sodium and chloride, potassium is one of the body's three major electrolytes, which means they have the ability to conduct electricity when dissolved in water and are the main particles responsible for osmotic pressure and body fluids. Potassium is the primary electrolyte functioning inside our cells, while sodium and chloride predominately function outside the cell. Potassium is important in regulating the frequency and degree to which our muscles contract and the degree to which our nerves become excitable. This essential mineral helps regulate pH levels in body fluids, blood pressure as well as muscle, and nerve activity, including the beating of the heart.

What you should know?

Potassium is readily absorbed through the intestinal tract, and excess is efficiently excreted in the urine via the kidneys. However, kidney failure, the use of potassium-sparing diuretics, or a large oral dose of potassium (more than 18g) may lead to dangerously elevated potassium concentrations (hyperkalemia). Symptoms are tingling of hands and feet, muscular weakness, and temporary paralysis. This can lead to an abnormal heart rhythm and eventual cardiac arrest.

Where you get it?

- Potato with Skin
- Prunes
- Raisins
- Banana
- Acorn Squash
- Lima Beans
- Green Leafy Vegetables
- Crimini Mushrooms
- Coconut Water
- Meat
- Pumpkin
- Cauliflower
- Dairy Products



How it is destroyed in preparation?

Losses from cooking are extensive (~50%). It is easily leached out by water.

What are some signs of potassium deficiency?



- Fatigue
- Heart problems
- Muscle weakness
- Irritability
- Cellulite
- Thyroid dysfunction/ Hypothyroid
- High blood pressure

Selenium

RDI: 70 mcg

Why you need it?

Humans and animals require selenium for the synthesis of selenium-dependent enzymes called selenoproteins. Selenium plays important roles in detoxification and antioxidant defense mechanisms in the body and seems to have a strong protective synergy with vitamin C and E. A deficiency in selenium may put one at risk for impaired immune function, viral infection, certain types of cancer and cardiovascular diseases. Adequacy of selenium can help to protect against the free radicals that are generated by everyday living, and in response to cigarette smoke, pollution, heavy metals, and other environmental factors including today's modern toxins found in foods as well as in home and beauty products. Like iodine, selenium is essential for proper functioning of the thyroid gland. It helps to regulate how much T3 (a version of the thyroid hormone) is produced.

What you should know?

Selenomethionine is a superior bioavailable form.

Where you get it?

- Brazil Nuts
- Seafood (tuna, halibut, lobster, salmon)
- Liver
- Dairy (Human Breast Milk contains 6x more Selenium than Cow's Milk)
- Eggs
- Muscle Meats
- Whole Grains
- Garlic
- Cabbage
- Celery



How it is destroyed in preparation?

Selenium in beans and vegetables is easily destroyed by boiling (~50%). In addition, 75% of the Selenium is depleted when wheat is turned into white flour. Processing of rice is equally as devastating (brown rice has 15x more Selenium than white rice). Selenium in meat sources is quite stable when cooked.

What are some signs of selenium deficiency?



- White nail beds
- Discoloration of skin and hair
- Weakness in the muscles
- Anxiety and depression
- Thyroid dysfunction
- Signs of premature aging
- Cataracts
- High blood pressure
- Infertility

Silica

none established

Why you need it?

The largest concentrations of silicon are found in the skin, hair and cartilage, but it also occurs in connective tissue, tendons, bone, trachea, aorta and lungs. A silicon deficiency may be associated with the development of osteoarthritis, osteoporosis and some aspects of cardiovascular disease. Silicon is often referred to as the beauty mineral in that it is often used to enhance the look of hair, nails and skin. Moreover, some epidemiological and experimental studies suggest that silica can reduce oral absorption of aluminum and/or enhance aluminum excretion and protect against aluminum-induced adverse effects, which may help in the prevention of Alzheimer's disease.

What you should know?

Although silicon is the most abundant mineral on earth, the discovery of its role as an essential nutrient is quite recent and very little research has been done regarding its metabolic activity and optimal dosage ranges.

Where you get it?

- Beer
- Coffee
- Mineral Water
- Fish
- Nuts/Seeds
- Oats
- Bran
- Brown Rice
- Whole Grains
- High Fiber Vegetables
- Fruits (such as Mangoes, Melons, Dates and Apples)



How it is destroyed in preparation?

It is unknown the effects of preparation.

What are some signs of silicon deficiency?



- Silicon is so abundant in the environment that outright deficiencies do not occur.

Sodium Chloride (Salt)

Sodium: 2300 mg
Chloride: 3600 mg

Why you need it?

Refined table salt in general is comprised of approximately 40% sodium (Na⁺) and 60% chloride (Cl⁻), both of which are essential micronutrients, also known as electrolytes. Their tight regulation of membrane potential through the cell is critical for muscle contraction, cardiac function and nerve impulse transmission. Sodium also plays a role in the absorption of amino acids, glucose, chloride and water, while chloride in the form of hydrochloric acid, found in gastric juice, aids the absorption of digestion of many macro and micronutrients.

What you should know?

Although many of us have been told to cut down on our salt intake, the fact is salt is essential to life and while table salt and refined sea salt is known for raising one's blood pressure, unrefined salt contains essential minerals such as potassium, calcium and magnesium in addition to sodium and can actually reduce blood pressure. Abnormally large doses of salt can lead to increased extracellular fluid volume, but as long as water needs can be met, an individual with normally functioning kidneys can excrete the excess sodium and normalize the fluid volume.

Where you get it?

- Caviar
- Soy Sauce
- Cheese
- Seafood/Seaweed
- Eggs
- Meats
- Beets
- Turnips
- Tomato/Tomato Juice
- Carrots



How it is destroyed in preparation?

It is unknown the effects of preparation.

What are some signs of sodium deficiency (hyponatremia)?



- Vomiting or diarrhea
- Excessive and persistent sweating
- Headache
- Nausea
- Muscle Cramps
- Fatigue
- Disorientation
- Swelling

Zinc

RDI: 15 mg

Why you need it?

Zinc is an essential micronutrient that is required for the functioning of over 300 different enzymes and plays a vital role in an enormous number of biological processes. Additionally, zinc is necessary for the regulation of genetic activity and protein and cell membrane structure. In humans, the highest concentrations of zinc are found in the liver, pancreas, bone, kidneys and muscles, but it is also highly concentrated in parts of the eye, prostate gland, sperm, skin, hair and nails. This essential mineral helps to regulate a wide variety of immune system activities. Zinc supports smell and taste because Gustin, a small protein that is directly related to taste, must be attached to zinc for taste to work. Taste and smell are so entwined that this then affects smell. Additionally, zinc is necessary for dark adaptation and night vision, wound healing, thyroid function, metabolic rate, sexual function, and blood sugar balance.

What you should know?

Zinc is relatively non-toxic and although the toxicity has been reported in humans, it is uncommon. Zinc deficiency can be due to diets high in foods containing large amounts of phytic acid, which has an absorption blocking effect on the zinc.

Where you get it?

- Oysters, mussels, crab
- Liver
- Dairy
- Dungeness Crab
- Beef
- Dark Meat Chicken
- Eggs
- Pork
- Whole Grain
- Lamb
- Nuts
- Green Peas



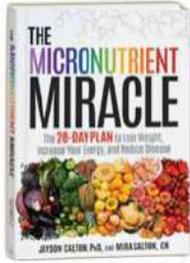
How it is destroyed in preparation?

Food processing removes 75% of zinc content from grains. Like most minerals, zinc incurs great losses in the presence of water. Boiling and blanching should be avoided.

What are some signs of zinc deficiency?



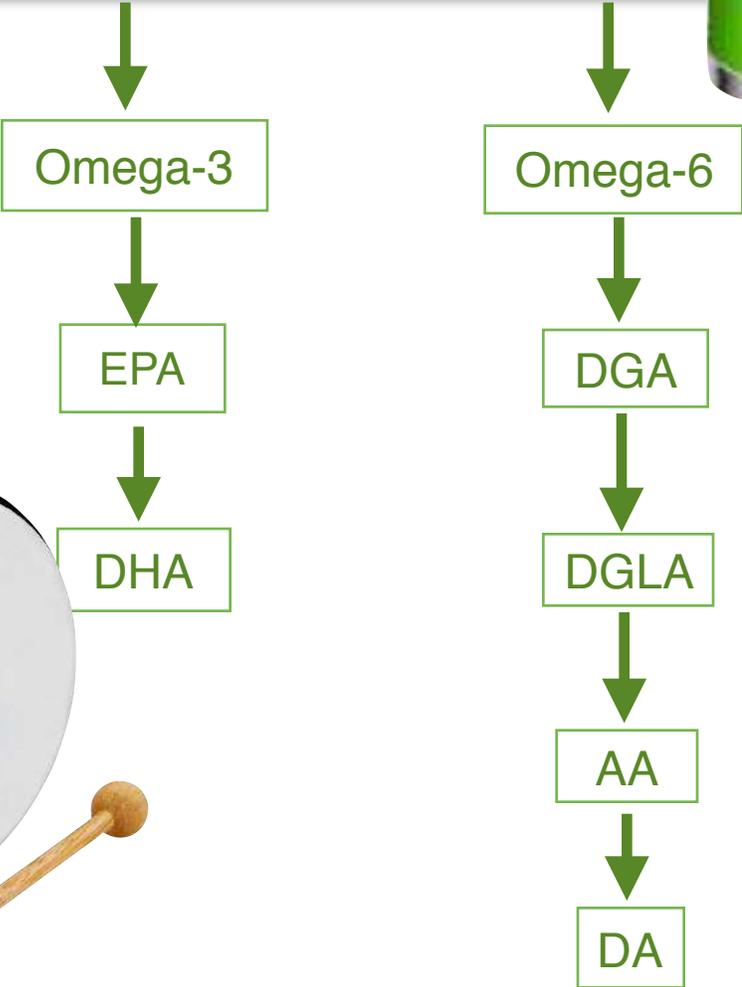
- Growth failure (dwarfism, hypogonadism and failure to mature sexually).
- Anxiety & Depression
- Impaired sense of taste and/or smell
- Poor immune system
- Poor appetite
- Night blindness
- Stretch marks
- Acne
- Hypothyroid/Thyroid dysfunction



THE MICRONUTRIENT MIRACLE

GUIDE TO:

The Percussion Section or Essential Fatty Acids (EFAs)



Omega-3

RDI 1.6 g

Why you need it?

Omega-3 fatty acids (ALA, EPA, DHA) are one of the two classes of micronutrients called essential fatty acids (EFAs). As their name implies, EFAs are essential to mammals because we cannot synthesize them. A major source of their benefits can be found in their anti-inflammatory properties. Omega-3 is a structural component of cell membranes. DHA may have an especially important role in vision and nervous system function in that it is selectively incorporated into postsynaptic neuronal cell membranes, as well as retinal cell membranes. Studies indicate that DHA is required for the normal development and function of the retina, where DHA is found in high concentrations. DHA is found in high proportions in the phospholipids of the gray matter of the brain. A deficiency of DHA may be related to learning defects. Research shows that both omega-3 and omega-6 fatty acids may actually have the ability to modulate the expression of our genes, including genes involved in inflammation and fatty acid metabolism. Omega-3s are also heart protective, as they serve as the raw materials for making compounds that are critical to proper blood clotting, helping arteries to relax and contract properly.

What you should know?

Omega-3s can be found in both plant and animal sources; however, plant sources only contain a kind of omega-3 known as alpha linolenic acid (ALA) and do not contain EPA or DHA. Conversely, animal/algae sources naturally contain both EPA and DHA, which do not require conversion and can be directly absorbed. This is important because ALA has not been shown to have the same cardiovascular benefits as EPA and DHA. While it is true that humans can convert ALA into EPA and then DHA in the body, this elongation process only takes place at efficiency rate of ~5-10% and ~2-5%, respectively.

Where you get it?

- Herring/Sardines (all fish should be wild caught)
- Salmon (Chinook, Atlantic, then Sockeye)
- Oysters/Dungeness Crab
- Rainbow Trout
- Canned, White Tuna (and Light)
- Flaxseeds/Flaxseed (linseed) Oil
- Chia Seeds
- Walnuts (English)/Walnut Oil
- Grass-Fed Beef
- Pastured Eggs
- Mammal Brains and Eyes (Lamb, Pork, etc.)



How it is destroyed in preparation?

All polyunsaturated oils, including omega-3 and omega-6 fatty acids are extremely susceptible to oxidation (becoming rancid) from heat, light and oxygen. Whole food sources such as flaxseeds as opposed to flaxseed oil are better protected. Omega-3 oil's should be stored in a dark or opaque glass container in a refrigerator or freezer and should never be heated on the stove for sautéing, as this will damage the oil. Instead, use these oils cold in yogurt or on salad.

What are some signs of Omega-3 deficiency?



- Dry scaly rash
- Decreased growth in infants and children
- Decreased immune system
- Poor wound healing
- Health conditions marked by inflammation (-itis)
- Anxiety & Depression

Omega-6

RDI 17 g*

***Special Note: This daily dose has been seriously questioned, due to a methodology error, whereby these needs may have been overestimated by 5-15x the actual requirements.**

Why you need it?

Omega-6 fatty acids (LA, GLA, DGLA, AA, DA) are the other type of essential fatty acid (EFA). Although omega-6 fatty acids are typically associated with inflammation while omega-3 fatty acids are considered anti-inflammatory, GLA and DGLA are both thought to have anti-inflammatory properties. While omega-6 fatty acids are essential, the American diet is so full of plant-based oils that contain high amounts of omega-6 (particularly LA) that the ratio of omega-6 to omega-3 can be as high as 30:1. It is thought that an equal or slightly greater ratio of omega-3 to omega-6 fatty acids is best for the promotion of health. Think yin and yang.

What you should know?

Omega-6s can be found in both plant and animal sources; however, plant sources mostly contain omega-6s known as alpha linoleic acid (LA) and GLA. While it is true that humans can convert LA into GLA and then DGLA in the body, this elongation process only takes place at efficiency rate of ~5-10% for LA-GLA, and the GLA-DGLA rates are less clear, but likely at a similar rate. As such, it may be beneficial to obtain your omega-6 from sources naturally high in GLA, such as evening primrose, borage or black currant oils.

Where you get it?

- Safflower Oil
- Grape Seed Oil
- Sunflower Seeds/Oil
- Soybean Oil
- Olive Oil
- Brazil Nuts/Pecans/Cashews/
Pine Nuts
- Sesame Oil
- Evening Primrose Oil
- Borage Oil
- Blackcurrant Seed Oil
- Flaxseed (Linseed) Oil
- Rapeseed (Canola) Oil
- Hemp Oil
- Most Seed Oils
- Whole-Grain Breads/Durum



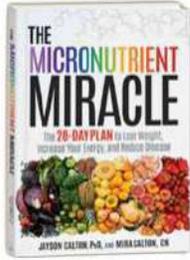
How it is destroyed in preparation?

All polyunsaturated oils, including omega-6 and omega-3 fatty acids are extremely susceptible to oxidation (becoming rancid) from heat, light and oxygen. Whole food sources such as olives, as opposed to olive oil are better protected. Omega-6 oils should be stored in the dark or opaque glass containers and should not be heated on the stove for sautés or sauces to temperatures over 350°F, as this may damage the oil (with the exception of grapeseed oil, which has a small point of 428°F): remember you bought your extra-virgin olive oil or flaxseed oil “cold-pressed” for a reason. For the most nutritional benefit, you may want to use these oils cold on cooked meat/fish or on salads, and if you are looking for an alternative to cooking with olive oil, you may want to try butter, SKINNYFat, or coconut oil. You can prolong the life of omega-6 oils, by keeping them refrigerated.

What are some signs of Omega-6 deficiency?



- Dry scaly rash
- Decreased growth in infants and children
- Decreased immune system
- Poor wound healing



THE MICRONUTRIENT MIRACLE

GUIDE TO:

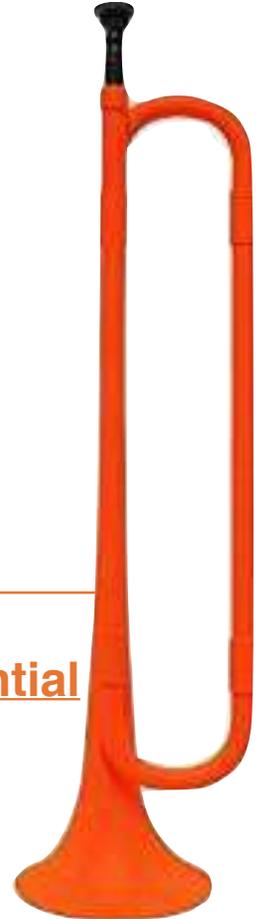
The Brass Section or Essential Amino Acids

Essential

Histidine
Isoleucine
Leucine
Lysine
Methionine
Phenylalanine
Threonine
Tryptophan
Valine

Conditionally Essential

Arginine
Cysteine
Glutamine
Tyrosine
Glycine
Ornithine
Proline
Serine



Histidine

14 mg/kg body weight

Why you need it?

Histidine is essential in the production of histamine, which has roles in immune response and as a neurotransmitter. It also is used to create carnosine, which has antioxidant properties. Moreover, it helps maintain the myelin sheaths on nerve cells. It is a natural detoxifier for the body. Low levels have been linked rheumatoid arthritis and deafness from nerve damage.

What you should know?

Histidine requires vitamins B3, B6 and C to be properly metabolized.

Where you get it?

- Meats (Pork, Poultry, Beef, etc)
- Egg White
- Fish
- Dairy
- Whey

How it is destroyed in preparation?

Histidine is destroyed by exposure to light and oxygen in storage.

Isoleucine

19 mg/kg body weight

Why you need it?

Isoleucine, as well as the other two branched-chain amino acids (BCAAs): leucine and valine, plays a critical role in supplying energy to the muscles, particularly during strenuous exercise. It is also effective at preventing muscular wasting associated with aging, amyotrophic lateral sclerosis (ALS), anorexia, bedridden patients and in various cancers. This amino acid that is best known for its ability to increase endurance and help heal and repair muscle tissue and encourage clotting at the site of injury.

What you should know?

Vitamin B7 (biotin) is essential for the total breakdown of isoleucine and leucine and thus must be sufficient to adequately utilize isoleucine.

Where you get it?

- Eggs
- Turkey
- Chicken
- Lamb
- Fish
- Cheese
- Whey
- PeasWhey
- Wheat germ

How it is destroyed in preparation?

Great news!! BCAAs, such as isoleucine, are relatively stable to light, heat and air.

Leucine

42 mg/kg body weight

Why you need it?

Leucine is essential to the liver, muscle and adipose tissue and is the only dietary amino acid with the ability to stimulate muscle proteins synthesis. It plays a critical role in supplying energy to the muscles, along with the other two branched-chain amino acids (BCAAs): isoleucine and valine. The prevention of muscular wasting, associated with aging, amyotrophic lateral sclerosis (ALS), anorexia, bedridden patients, following strenuous exercise and in various cancers, is amongst the primary roles of leucine.

What you should know?

Vitamin B7 (biotin) is essential for the total breakdown of leucine and isoleucine and thus must be sufficient to adequately utilize isoleucine. Moreover, leucine deficiency can be the result of inadequate vitamin B6.

Where you get it?

- Whey
- Beef
- Peanuts
- Pork
- Salmon
- Wheat Germ
- Almonds
- Chicken
- Egg Yolk

How it is destroyed in preparation?

Great news!! BCAAs, such as leucine, are relatively stable to light, heat and air.

Lysine

38 mg/kg body weight

Why you need it?

Lysine is a necessary building block for all protein in the body and without it no other proteins are assimilated. In conjunction with glycine and proline, lysine helps with producing collagen, which is essential for maintaining hair, skin, nail and connective tissue health. Other important roles include recovery from injury, and in the production of hormones, enzymes and antibodies. Moreover, lysine is able to interact with serotonin receptors to reduce anxiety and anxiety-induced gastrointestinal distress. Some studies have shown that lysine may be beneficial for those with herpes simplex infections.

What you should know?

Lysine improves calcium absorption, thus improving its bioavailability and reducing the total amount of calcium needed to be taken.

Where you get it?

- Eggs
- Beef
- Pork
- Poultry
- Whey
- Cheese
- Cod
- Sardines
- Lentils

How it is destroyed in preparation?

Lysine can be slightly reduced by high heat.

Methionine

19 mg/kg body weight

Why you need it?

Methionine has antioxidant properties, can help prevent heavy metal toxicity by chelating these metals and acts as a precursor to the amino acids, proteins and hormones, such as cysteine, taurine, carnitine, choline, adrenaline and melatonin. It also plays a role in the prevention of neurodegenerative and cardiovascular diseases.

Methionine has a fat-dissolving effect and reduces the depositing of fat in the liver. It has anti-inflammatory properties, acts as a pain-reliever and stimulates the formation of cartilage tissue.

What you should know?

Interestingly, some animal studies have shown that methionine restriction may increase lifespan; however, since methionine is so vital and this research has not been carried out in humans, and its myriad of roles as an essential amino acid, it is still important to maintain sufficient levels of dietary intake.

Where you get it?

- Eggs/Egg Whites
- Sesame Seeds
- Cheese
- Brazil Nuts
- Whey
- Chicken
- Tuna/Salmon
- Beef
- Pork

How it is destroyed in preparation?

Dehydration may reduce levels of methionine in food.

Phenylalanine (+tyrosine)

33 mg/kg body weight

Why you need it?

Phenylalanine acts as a precursor to the amino acid, tyrosine, which then eventually leads to the production of the catecholamines: dopamine, norepinephrine (noradrenalin) and epinephrine (adrenaline). Deficiency may lead to depression, confusion, lack of appetite, as well as impaired memory and energy.

What you should know?

Phenylalanine uses the same pathways across the blood-brain barrier as tryptophan, thus excessive levels can potentially lead to deficiencies in serotonin, niacin and melatonin. Additionally, the relatively rare genetic disorder phenylketonuria (PKU) is the result of an impaired ability to break down phenylalanine, leading to excess levels in the brain, which can result in developmental delay, seizures and attention deficit disorders.

Where you get it?

- Beef
- Poultry
- Pork
- Fish
- Dairy (Milk/Yogurt/Cheese)
- Whey
- Nuts
- Legumes
- Seeds

How it is destroyed in preparation?

Phenylalanine is relatively stable to light, oxygen and heat.

Threonine

20 mg/kg body weight

Why you need it?

Threonine is converted to glycine in the body, where it has a role in mitigating the effects of spasticity in disorders, such as multiple sclerosis (MS) and amyotrophic lateral sclerosis (ALS), as well as in the production of collagen, elastin and enamel. It also assists in fat metabolism in the liver and with maintaining proper function of the gastrointestinal tract. Threonine helps to keep connective tissues and muscles in the body elastic and strong, including the heart, where it is found in significant amounts. It also aids in bone and tooth enamel building, and may help to speed wound healing or recovery from injury.

What you should know?

Adequate vitamin B12 is required for some of threonine's metabolic pathways.

Where you get it?

- Turkey
- Chicken
- Eggs
- Whey
- Beef
- Cottage Cheese
- Fish
- Lentils
- Black Beans
- Sesame Seeds

How it is destroyed in preparation?

Great news!! Threonine is relatively stable to preparation.

Tryptophan

5 mg/kg body weight

Why you need it?

Tryptophan is a precursor in the production of niacin and the neurotransmitter serotonin, which in turn produces the hormone melatonin. It plays a role in decreasing anxiety, decreasing appetite, promoting normal sleep patterns and has shown improvements in irritable bowel syndrome (IBS). It can be useful in reducing Premenstrual Symptoms (PMS). Deficiencies can lead to mood swings and depression.

What you should know?

Tryptophan, with the assistance of vitamins B1, B2 and B6, is a provitamin to vitamin B3 (niacin) and thus can help insure niacin sufficiency.

Where you get it?

- Whey
- Cocoa Powder
- Cashews
- Peas
- Pork
- Salmon
- Oats
- Walnuts
- Eggs
- Turkey

How it is destroyed in preparation?

Great news!! Tryptophan is not water-soluble and relatively resistant to cooking.

Valine

24 mg/kg body weight

Why you need it?

Valine, as well as the other two branched-chain amino acids (BCAAs): leucine and leucine, plays a critical role in supplying energy to the muscles, particularly during strenuous exercise. It is also effective at preventing muscular wasting associated with aging, amyotrophic lateral sclerosis (ALS), anorexia, bedridden patients and in various cancers.

What you should know?

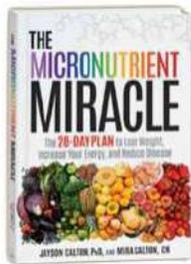
Valine helps bind proteins together.

Where you get it?

- Eggs
- Turkey
- Chicken
- Lamb
- Fish
- Cheese
- Whey
- Seaweed

How it is destroyed in preparation?

Great news!! BCAAs, such as valine, are relatively stable to light, heat and air.



THE MICRONUTRIENT MIRACLE

GUIDE TO:

Smart Supplementation Guidelines



How do you choose a well-formulated multivitamin?

The answer is simple as the ABCs.

During our years of research studying micronutrients, we identified 4 major formulation flaws in the typical multivitamin. These pitfalls stand as roadblocks on your journey to achieving the extraordinary health you deserve. Until the multivitamin industry eliminates these problematic pitfalls you are simply wasting your money on supplements that just don't work. Luckily, because of our need for a multivitamin that would help Mira reverse her advanced osteoporosis, we developed our own delicious, easy to drink, multivitamin beverage called nutreince, which uses cutting edge, patented technology to eliminate the 4 flaws of multivitamin formulation and finally unlock the health producing benefits of the micronutrient.

In the process of developing nutreince, we created an easy to remember acronym to help consumers identify superior supplements. We call it the ABCs of Optimal Supplementation Guidelines. The letters A, B, C and S all stand for 1 of the 4 formulation flaws that make other multivitamins deliver less than they should.

NUTREINCE IS THE ONLY MULTIVITAMIN FORMULATED TO FOLLOW THE ABCs OF OPTIMAL SUPPLEMENTATION GUIDELINES.

NUTREINCE DELIVERS SUPERIOR ABSORBENCY



- ✔ **Nutreince is convenient** for the 40% of men, women and children who have a hard time taking pills or tablets.
- ✔ **All the great tasting, naturally flavored** nutreince options are sweetened with all natural stevia leaf, while nutreince natural contains no flavor or sweetener for the purest at heart. Nutreince never contains insulin spiking sugars or artificial sweeteners.
- ✔ **Nutreince replaces micronutrient depleting beverage choices**, such as soda and energy drinks, with healthy micronutrient packed hydration.
- ✔ **Nutreince's single serving packets** lock out the light and air to protect the potency of your multivitamin.
- ✔ **Nutreince is free of binders, fillers, preservatives, and allergens** including starch, wheat, seeds, nuts, and fish. nutreince is also free of sugar, HFCS, gluten, caffeine, lactose, and fat.
- ✔ **Nutreince is great for everyone** – including low calorie, low carbohydrate and low fat dieters and is vegan/vegetarian and paleo/primal friendly.
- ✔ **Nutreince replaces handfuls of pills** and supplies 100% of the daily value (DV) of 20 essential vitamins and minerals adults and children need—more than any other major brand.

NUTREINCE SUPPLIES BENEFICIAL QUANTITIES AND FORMS

Wouldn't you be angry if you thought you purchased a Porsche, but you received a Yugo? That kind of bait and switch is common in the multivitamin world. Most manufactures use cheap, inferior forms of vitamins and minerals. Or worse yet...they don't include them at all. That's right. Many times, those so called "complete" multivitamins are "completely lacking" at providing the beneficial quantities you need for each essential micronutrient. And don't be fooled by misleading manufactures supplying you with mega-doses of certain micronutrients either. In the world of multivitamin formulation, more is not always better. Here is a brief overview of the beneficial quantities and forms for some of the amazing micronutrients you will find in nutreince.

- ✔ **Vitamin A:** *Preformed Vitamin A and Beta-Carotene, Astaxanthin, and Zeaxanthin.* Some multivitamins only contain beta-carotene, an inactive form of vitamin A (provitamin A), which must be converted in the body to retinal (preformed), an active form (conversion rate of 21:1). Due to the poor conversion rate of beta-carotene, a supplement should be formulated to include at least 2,500 IU of preformed vitamin A (retinyl acetate or palmitate). nutreince contains 2500 IU preformed vitamin A and 2500 IU beta-carotene.
- ✔ **Lutein:** Most multivitamins do not contain lutein at all, but we have added 6 milligrams of lutein to nutreince because this is the amount that is recommended to prevent/reverse Age-Related Macular Degeneration (AMD). Lutein is also a potent antioxidant!
- ✔ **Vitamin B2 (Riboflavin):** nutreince is formulated with riboflavin 5 phosphate, the principal form in which vitamin B2 is found in cells and tissues - readily absorbed.
- ✔ **Vitamin B3 (Niacin & Niacinimide):** There are two forms of vitamin B3 - Niacin and Niacinimide. Most multivitamins only contain niacinamide. However, the two forms of vitamin B3 perform completely different functions in your body. Niacin has a "flushing" effect, and has been shown to lower LDL (bad cholesterol) and raise HDL (good cholesterol), where as niacinimide does not have these effects, and instead has been shown to be anti-inflammatory and beneficial in Alzheimer's disease, nutreince contains both forms.
- ✔ **Vitamin B5 (Pantothenic Acid):** D-Calcium Pantothenate is the natural form of pantothenic acid and is the most commonly used supplemental form of this vitamin. It is more stable than free pantothenic acid and is well absorbed in the digestive tract.
- ✔ **Vitamin B6:** nutreince contains the active co-enzyme form of B6, pyridoxal-5-phosphate (P-5-P.) However, many inferior products use pyridoxine HCl, which is not the active form of this B vitamin.
- ✔ **Vitamin B9 (Folate):** Research published in the American Journal of Epidemiology shows that more than 34% of the US population may have a genetic enzyme defect known as MTHFR mutation that makes it difficult for them to convert folic acid into biologically active L-5-MTHF, and new estimates suggest that up to 60% of the population may be affected. For these individuals and many others, L-5-MTHF may be a more effective method of folate supplementation. nutreince contains 400 mcg of L-5-MTHF (quatrefolic).
- ✔ **Vitamin B12 (Methylcobalamin):** The standard source of B12, cyanocobalamin, is not a natural source. In fact, its not found anywhere in nature and must be converted by the liver into methylcobalamin in order to be utilized in humans (and all other animals). Cyanocobalamin is typically found in products such as Centrum and One-A-Day. Methylcobalamin is the form of vitamin B12 active in the central nervous system. It is essential for cell growth and replication making it the best choice for nutreince!
- ✔ **Vitamins C & E:** nutreince contains statin safe quantities of vitamins C and E. Science has shown us that more is not always better when it comes to the amount of vitamin C and E one should be taking if they are currently taking a statin drug. The anti-inflammatory effect of cholesterol-lowering statin drugs can be inhibited by taking mega doses of either vitamin C (more than 200 mg) or vitamin E (more than 100 IU). nutreince contains only the RDI of both of these vitamins (60 mg, 30 IU respectively), well within the safe range for statin takers.

- ✔ **Vitamin D:** nutreince includes 2000 IU of vitamin D, (the amount emerging science is currently recommending for optimal health) and in the best D3 form. There are two forms of vitamin D available in supplements: vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). D3 is the form that is produced in our skin when we are exposed to sunlight, and is more biologically active and superior for supplementation. In fact, research published in *The American Journal of Clinical Nutrition*, found that vitamin D2 supplementation actually caused a reduction in overall serum concentrations of vitamin D (25(OH)D) over 28 days, with serum levels actually falling below baseline (starting) levels! The researchers concluded that that vitamin D2 should no longer be regarded as a nutrient appropriate for supplementation or fortification of foods.
- ✔ **Vitamin E:** Vitamin E is split into two families: the tocopherols and the tocotrienols, each containing four unique derivatives (alpha, beta, gamma, and delta). nutreince contains the full spectrum of each. Look on the label for “full spectrum d-tocopherols and d-tocotrienols.” University of California studied the two families and found that tocotrienols are 40–60% more effective as antioxidants. new research suggests that delta-tocotrienol can completely prevent the erosion of the bone surface, and was also effective in increasing bone formation and preventing bone reabsorption. Additionally, avoid the synthetic form of this vitamin that starts with a “dl-”. According to a study published in the *American Journal of Clinical Nutrition*, researchers found that levels of natural vitamin E (d-tocopherol) in the blood and in the organs were double that of synthetic vitamin E (dl-tocopherol) when compared, showing natural vitamin E is better retained and more biologically active than synthetic.
- ✔ **Vitamin K:** This micronutrient is often omitted from many multivitamin formulations, but is essential for bone strength/building and heart health. It is important for a supplement to include both K1 and K2 and it is even more superior and rare if it also includes both forms of vitamin K2 (MK-4 and MK-7), like nutreince does. Vitamin K1 plays a role in blood clotting, while K2 is a more important inducer of bone mineralization in human osteoblasts (bone-building cells). Vitamin K2 has been proven in studies to be as effective as prescription drugs in reducing the incidence of bone fractures. Additionally, because K2 directs calcium out of the arteries and into the bones where it is needed, K2 is essential for the prevention of coronary heart disease. While many people think vitamin K should be avoided when taking a blood thinner (like warfarin/coumadin), it is safe to take nutreince as long as you consult your physician prior to doing so. Based on your individual situation, your physician may wish to adjust the dosage of your blood thinner. It is also important to let your physician know if you stop taking nutreince as your doctor may have to readjust your blood thinner.
- ✔ **Calcium:** nutreince delivers the maximum amount of calcium that can be absorbed by the body at one time (600 mg). This is the only micronutrient that should be less than 100% RDI. While pills and capsules should use calcium citrate or malate as they are more absorbable, liquids and powders have an additional option. Combining calcium carbonate with non-GMO citric acid stimulates the conversion of the calcium carbonate to calcium citrate in water, thus supplying the best absorption in a liquid form.
- ✔ **Chromium:** nutreince is formulated with Chromium polynicotinate (not picolinate) Research has suggested that chromium picolinate may be linked to causing DNA damage. While the jury is still out on whether or not this is true, we decided to use the safest, most absorbable form of chromium in nutreince - chromium polynicotinate - a pure niacin-bound form of chromium, identified by U.S. government researchers as the active component of true GTF (Glucose Tolerance Factor) - which regulates the body's use of glucose and helps to balance blood sugar levels. This is an extremely important micronutrient for those with diabetes.
- ✔ **Iodine:** nutreince contains kelp, a natural form of iodine that can have a normalizing effect on the thyroid gland. This means that thin people with thyroid trouble due to an iodine deficiency can gain weight by become sufficient in iodine, and obese people can lose weight. Many people with low salt diets can fall short in this mineral as ionized table salt is the primary source of iodine in the U.S. diet.
- ✔ **Magnesium:** Most multivitamins supply small amounts of magnesium because of its bulky size. Locate supplements that supply 400 mg of magnesium, a micronutrient responsible for over 300 essential metabolic reactions in the body as well as controlling sugar cravings. Similar to calcium, in water magnesium carbonate is converted to magnesium citrate, one of the most bioavailable forms, through ionic conversion using non-GMO citric acid.

- ✔ **Selenium:** nutreince contains selenomethionine, generally considered to be the best absorbed and utilized form of selenium.
- ✔ **Vanadium:** In studies this mineral has been shown to possibly improve glucose tolerance. Nutreince is formulated with Vanadyl Sulfate Hydrate a form that is best absorbed.
- ✔ **CoQ10:** This is a micronutrient you won't find on the label of most multivitamins - it is just too expensive to include! However, we need CoQ10 to combat free radicals, maintain a healthy blood pressure, support our nervous and immune systems and to energize every cell in our body. For those individuals who are taking statins it is essential to replenish their CoQ10 levels because statin drugs directly deplete CoQ10.
- ✔ **Carnitine and Choline:** Just when you thought nutreince can't get any better - here is the icing on the cake. Did you know that the combination of choline and carnitine has been called the "nutritional equivalent to liposuction"? nutreince includes all three forms of carnitine (L-Carnitine, N-Acetyl L-Carnitine & Propionyl L-Carnitine) because like the micronutrients we discussed earlier (vitamins B3 and E), each form is thought to have unique benefits. nutreince also contains 425 mg. of choline - an essential micronutrient rarely found in multivitamins.
- ✔ **Alpha Lipoic Acid, Quercetin and Grape seed extract:** We hear a lot about the importance of antioxidants, but do you know why alpha lipoic acid is often referred to as the "King" of all antioxidants? It is because it is nature's only known "universal" antioxidant. This means that it is both fat-soluble and water-soluble and because of this is able to work throughout the entire body. Additionally, while most antioxidants are "used up" after they attack free radicals, scientific evidence suggests that alpha lipoic acid has the unique ability to regenerate these other antioxidants - making it so they can attack free radicals over and over again. By combining alpha lipoic acid with quercetin and grape seed extract (two of the most powerful antioxidants on the planet) we exponentially enhanced the ability of nutreince to fight free radicals and enhance your health. Additionally, grape seed extract shares a synergistic relationship with vitamin C, boosting vitamin C absorption by 50 percent.

YOUR MULTI SHOULD NOT CONTAIN

- ✔ **Copper:** Taking a multivitamin with copper is generally not recommended because too much can hinder your body's ability to destroy the proteins that form the plaques found in the brain of Alzheimer's patients. Many Alzheimer's patients have elevated levels of copper, and in studies, it was determined that many of those affected took multivitamins with copper. Additionally, pregnant women should avoid copper in multivitamins because copper levels can nearly double during pregnancy, making toxicity a concern. Cramps, abdominal pain, vomiting, nausea, and diarrhea are all common when taking supplements that include copper. **nutreince is copper-free**
- ✔ **Iron:** Iron is a vital mineral your body needs to function normally. However, the National Institutes of Health's Office of Dietary Supplements has indicated that too much iron can cause serious health complications. Because of this, you may want to take an iron-free multivitamin to avoid iron overload, a medical condition that causes excess iron to be stored in vital organs, such as the liver and heart. Too much iron may be toxic —and even fatal. In general, iron supplementation is not recommended for adult males and postmenopausal women. If you are a pre- menopausal woman, an athlete that works out for more than 6 hours a week, or a strict vegan/vegetarian, you may want to consider iron supplementation. However, you should know that iron competes with ten (10) other micronutrients – making multivitamins formulated with iron highly susceptible to poor absorption rates. If you choose to use an iron supplement, you should take it at a separate time from your daily multivitamin. **nutreince is iron-free**