Structure/Function Claims for Trace Mineral Complex

Electrolyte Minerals

Magnesium, Phosphorus, Potassium, Chloride, Sodium, and Sulfur

Trace Minerals

Vanadium, Chromium, Manganese, Copper, Zinc, Boron, Selenium, Iodine, and Molybdenum

The Electrolytes

Potassium (as potassium phosphate, potassium iodide)

A critical electrolyte, potassium, while found in every food you eat, is notoriously deficient in the Western diet. It is important in maintaining normal blood pressure, transmission of nerve impulses, relaxation and contraction of muscles, as well as helping with carbohydrate and protein metabolism.

It is estimated that fully 97% of people in the US do not get the recommended daily allowance of 4,700 milligrams (recently downgraded to 3,300 mg because not enough people were getting the real needed dosage). The most important factor in improving potassium reserves is in keeping a balance with sodium. It is recommended that the ratio be 2:1 of potassium over sodium.

Many have suggested that eating diets high in fruits and vegetables will cover your potassium needs, if it is not bound with chloride, the absorption is less than ideal. Only 40% of the potassium from a banana is retained. Foods high in potassium include sweet potatoes, legumes, beets, Swiss chard, yams, and white beans

- Essential electrolyte that supports healthy muscles and promote cardiovascular health [1], [2], [3], [4]
- Assists with energy production and supports optimal kidney function [5], [6]
- Helps balance fluids [7], [8]
- Supports electrolyte balance and normal pH [9], [10], [11], [12]

Magnesium (as magnesium chloride and magnesium sulfate)

This critical trace mineral is one of the most deficient in the Western diet. It is estimated that 67% of Americans do not ingest the RDA for magnesium. It is involved in over 350 enzyme reactions critical for maintaining optimal health. Magnesium is crucial in the function of the nervous system, muscle, cardiovascular, and bone health.

While dietary intake of magnesium would be ideal, it is generally believed that our present-day food supply is woefully low in this important mineral. One of the challenges in magnesium supplementation is that at high doses, it may cause diarrhea.

- Supports nerve, muscle, and bone health [13], [14], [15], [16], [17], [18]
- Helps reduce tiredness and fatigue [19], [20]

Phosphorus (as potassium phosphate)

While an essential mineral, a deficiency is rarely seen. Unfortunately, most of the phosphorus that many people ingest is in the form of phosphoric acid, found in many soft drinks. It is a form that is undesirable due to its acidity. Alkaline forms, like potassium phosphate are preferred.

Vitamin D deficiencies, commonly found today, decrease the ability to absorb phosphorus. This mineral is key in energy production as well as bone health.

- Helps maintain a balanced pH [21], [22]
- Helps build and support strong bones [23], [24]

Chloride (as sodium chloride and magnesium chloride)

Chlorides are important in achieving a balanced pH and the balance of water inside and outside your cells.

- Helps maintain acid-base balance [25], [26]
- Aids water balance [27], [28]

Sodium (as sodium chloride)

While it is an essential mineral, sodium intake is excessive in many diets around the world. It is predominantly elevated in processed foods, as sodium chloride, whose consumption has risen over the preceding decades. Excessive sodium use has been implicated in an increased incidence of stroke, hypertension, and water retention.

Sweating is one of the major reasons for sodium loss along some kidney disorders and some medications. The most important thing you can do in regard to sodium intake is to maintain a 2:1 ratio of potassium over sodium.

- Essential electrolyte that supports nerve function and healthy muscles [29], [30]
- Helps to regulate fluid balance [31], [32]
- Supports electrolyte balance and normal pH [33], [34], [35], [36]

Sulfur (as magnesium sulfate)

While there is no Recommended Dietary Allowance (RDA) for sulfur, there is a definitive need for it in our everyday diets. It is found in all connective tissue, and is a component of three important amino acids: cysteine, cystine, and methionine, and three vitamins: biotin, pantothenic acid (B5), and thiamin (B1)

- Vital element for many building blocks of life such as amino acids, tRNA, coenzymes, and cofactors [37], [38]

Trace Minerals

Vanadium (as vanadium nicotinate glycinate)

This ultra trace mineral is important to maintaining health, it is only needed in small amounts, up to about 100 micrograms per day. This is usually easily derived from diet, but some supplementation may be helpful.

- Promotes carbohydrate metabolism [39], [40]
- Activates glucose transport [41], [42]
- Supports healthy glucose and lipid metabolism [43], [44]

Chromium (as chromium glycinate nicotinate)

Another ultra trace mineral, chromium is essential in the metabolism of carbohydrates and lipids like cholesterol. Deficiencies are seen in aging and in an inability to properly handle sugars. Exercise, stress, trauma, and surgery can also deplete chromium levels. The increased ingestion of highly processed foods, especially those with refined sugar, stimulates an increased excretion of chromium.

- Helps support healthy blood sugar levels already within a normal range [45], [46]
- May help reduce cravings and support protein, carbohydrate, and lipid metabolism [47], [48]
- Helps support cardiovascular health [49], [50]

Manganese (as manganese bisglycinate)

This important trace mineral in involved in the metabolism of proteins, fats, and energy production. While excessive intake of manganese has been linked to a number of neurodegenerative diseases, it is still important in bone growth, development, and reproduction. Supplementation of manganese alone may cause imbalances with calcium, iron, and zinc, making it best to use within a balanced formula.

- Essential trace mineral [51], [52]
- Supports proper growth and health maintenance [53], [54]

Copper (as copper bisglycinate)

An essential mineral, it resides in almost all tissues in the human body, with the most being found in the liver, heart, brain, and kidney. It is important to keep a balance of copper with zinc in an 8:1 to 12:1 ratio. Important in the integrity of the myelin sheath over nerves, the synthesis

of hemoglobin, as well as the metabolism of Vitamin C, copper deficiency is not common, but can occur through the over supplementation of zinc.

- Promotes red blood cell formation, thyroid health, and more [55], [56]
- Helps maintain the health of organs and tissues [57], [58]

Zinc (as zinc sulfate)

This critical trace mineral is important in maintaining a healthy immune system, along with it being essential for growth and physical development and reproduction in both males and females. An impairment of the sense of smell and taste, as well as vision and appetite are signs of a potential zinc deficiency.

The average intake of zinc in the Western diet is estimated to be around 10 milligrams a day, or less than one-third the RDA. Zinc depletion is often times seen after physical stress or injury. It can also be reduced by attacks on the immune system by infections, or viruses.

- Supports immune system health [59,60]
- Essential mineral the body needs for overall health [61], [62]
- Powerful antioxidant that may reduce DNA damage [63], [64]
- Provides support for enzyme functions [65], [66]

Boron *(as boron glycinate)*

While only needing 1 to 4 milligrams of boron a day, it has been suggested that it is important for optimal health. It is especially important in bone metabolism as well as helping with calcium absorption and utilization in creating and supporting bone health.

In some studies, it has been suggested that boron supplementation improves calcium and magnesium retention as well as improving concentrations of testosterone and estrogen.

- Helps build and support strong bones [67], [68]
- Supports healthy testosterone levels [69], [70]
- Supports bon, joint, and brain health [71], [72]

Selenium (as selenium selenate)

This trace mineral is crucial in supporting health by being a strong antioxidant. While important at all stages of life, selenium seems to have its greatest influence on health in the elderly. It, along with Vitamin E, has been seen to help improve overall mental status along with decreasing depression, anxiety, poor appetite and fatigue.

While supplementing with selenium may be beneficial, ingesting more than 750-1000 micrograms per day over an extended period of time may be harmful.

- Maintains cardiovascular, thyroid, and immune health [73], [74], [75], [76], [77], [78]
- Powerful antioxidant which protects against free radicals and oxidative stress [79],
- Trace element that is essential for many of the body's basic functions [80], [81]
- Supports prostate and immune system health [82], [83], [84], [85]

Iodine (as boroganic glycine)

A critically important trace mineral, iodine is one of the most important factors in thyroid health. For many years, iodized salt was one of the main sources of iodine. With the recommendation of a reduction in sodium intake, the incidence of iodine deficiency has risen over the past few decades.

Iodine is also essential for the development of a healthy fetus and the normal development of a babies brain. Aside from these important functions, iodine also plays an important role in immune system health.

- Essential for metabolic functions and cellular health [86], [87]
- Vital nutrient for thyroid gland health [88], [89]
- Supports cardiovascular health [90], [91]
- Supports nerve and muscle function [92], [93], [94], [95]
- Supports synthesis of thyroid hormones [96], [97]

Molybdenum (as molybdenum glycinate)

The total content of this trace mineral is only 7 milligrams in the human body, it still ranks as essential in supporting optimal health.

- Important component of enzymes involved in metabolism [98], [99]
- Promotes general health and wellness [100], [101]
- Plays a vital role in metabolic processes in the body [102], [103]

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