

Article Document Series Part 3

A note to our readers:

This is an informative and important document covering the top 50 minerals for health. The original document is provided courtesy of California Earth Minerals, the maker of Terramin. The challenge is that the original document is 18 pages long! So, we decided to feature it each month, broken down into two page segments.

Minerals Health and Knowledge

What you need to know & what you thought you knew

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Emerging Complexity

Biochemistry is anything but simple. The more we know about the function for the human cell, the more we realize how incorrect our knowledge was only a few decades or years ago, and how much more we have to learn. In the recent past, biologists were almost arrogant in their assumptions about the simplicity of cell function, perhaps out of a need to feel that evolutionary processes could not have created such complexity in so short a relative geological time span.

One scientist was recently asked to give us an analogy about what we now know as the complexity of a living cell relative to what we thought it was 100 years ago. The esteemed scientist said that if the human cell at the time of Darwin was a mud hut in terms of understood complexity, today it has the complexity of a galaxy! Full of interdependent functionality and nano-robotic interaction, the intracellular "civilization" would boggle the mind if only it were taught correctly in schools.

All of these interlocking intra and intercellular processes depend on a nutritional foundation of the basic mineral elements of the earth, and probably most earth elements are involved. Yet the orthodoxy of science has the audacity to proclaim, as they did when cells needed to seem so simple, that our bodies only require 17 out of the 94 non-gas elements which exist on the periodic table of elements, for optimal health.

A hundred years ago, the human body was still believed to be composed of just 14 elements: oxygen, hydrogen, carbon, nitrogen, phosphorus, sulfur, calcium, magnesium, sodium, potassium, chloride, fluorine, silicon and iron. In recent times, we've added many metals and minerals to the list of the essential components of our existence, some of which you may have never even heard of. The most surprising findings have been the fact that we desperately require tiny amounts of hyper-trace elements to make the thousands of cellular processes work. Over the past 40 years the US FDA has created a list of such "essential" minerals. And since the tracking of such required minerals began, many additions have been made to this official list. Some elements with newly discovered health properties have been listed, other elements have been listed and then de-listed, some declined to be listed then listed, and some minerals have been considered poisonous, then found to be essential. Established RDA levels today have been changed many times over the years.

The search for the best understanding continues, and is by no means accurate or complete today. One consistent trend in the continued research is that the more we know, the more biologically complex we realize that we are, and the more we must accept how elementally tethered to the earth we are. You'd think such a history would make mainstream medical and science authorities humble about their "knowledge", but in fact, they seem more certain than ever that the present generally accepted "knowledge" is supreme.

The truth is that all human and animal bodies require far more mineral nutrients from natural sources than is officially recognized. On top of that, many of the synthetically produced metals and alloys given to humans in products and drugs are terribly toxic, even as we are continually assured that there are no problems associated with them. These minerals may go by the same common name, but they are not the same in their final chemical structure; and they do not produce the same in function. Even a natural form of any mineral in overdoses may be toxic when overdosed or when improperly balanced with other minerals, but minerals are especially risky in the form of man-made derivatives of manufacturing processes.

—The chemical form of a mineral is an important factor in its absorption and bioavailability...there is evidence that the form in which minerals are ingested affects absorption. For example, particle size, surface area, and solubility of a substance affects its dilution rate...In many solid foods, elements are not free, but firmly bound in the food matrix."

"—Yvette R. Schlusel, Ph.D

Minerals and the Nutritional Gap (Part 3)

Below is a list of minerals in alphabetical sequence that are generally accepted as essential or helpful in certain circumstances for health and function of the human body. Not all of these minerals are recognized by the various regulatory bodies of the US government as necessary, and some that are recognized have no established dietary intake levels established. The amounts listed as essential are from various sources including the FDA, but may not represent DV or RDI. Don't let anyone tell you that if the government has not sanctioned it or prescribed it, or provides it...it must be bad. You could be playing with your health and life. All elements can be toxic in amounts exceeding safe thresholds.

This list is accompanied by an indicator of the amount each element that exists in colloidal ionic suspension within 100% pure TERRAMIN® brands. Also shown is whether or not the US government considers the element an "essential" macro or micronutrient.

If you are considering taking minerals for medical treatment, consult your licensed physician or naturopath.

The Big 50 Minerals

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|----------|--------|------------------------|-------------------------|------------------------|--------------------|
| Carbon | (C) | N/A | none | 30-50 lbs | Nil |

Carbon is an essential element, but it is abundant because all life is based on carbon chains. So the food chain is essentially a carbon chain, and many chemical elements are bound to carbon. If you are eating enough calories, you are not carbon deficient. Electrolyte minerals and trace elements are not "organic" and therefore are independent of carbon. If your mineral supplement contains carbon, it is because it has been exposed to decomposed animal and plant life. TERRAMIN® is a pure mineral complex in its native form, with little exposure to prehistoric plants and animals, which is why it has so little carbon in it.

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|----------|--------|------------------------|-------------------------|------------------------|--------------------|
| Cerium | (Ce) | unknown | unknown | unknown | 79 ppm; 395 mcg |

Another hyper-trace element that acts as a biocatalyst in unknown and complex ways. It may be helpful for eye problems and other organs. It is used in wrist ligament centrioles, which is why it helps some people adapt to overcome carpal tunnel syndrome; similarly it is needed to strengthen patella ligatures. Yet research on cerium's health effects is lacking.

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|----------|--------|------------------------|-------------------------|------------------------|--------------------|
| Cesium | (Cs) | unknown | unknown | 0.00005 | 12 ppm; 60 mcg |

This trace element is a biocatalyst for your internal cellular environment, contained in the bodies of all mammals.

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|----------|--------|------------------------|-------------------------|------------------------|--------------------|
| Chloride | (Cl) | (2300 mg) | none | 3.3 oz | Nil |

Contained in relatively large amounts in body fluids, chloride is an electrolyte that is (along with potassium and sodium) necessary for cardiac rhythm and electrification of the body and pH balance. Digestive juices in the stomach contain hydrochloric acid. Chloride is an anion, so it does not adhere to TERRAMIN'S® silica structure. Fortunately, most people get enough...indeed too much chloride with sodium in the form of common table salt.

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|----------|--------|------------------------|-------------------------|------------------------|-------------------------|
| Chromium | (Cr) | (80-200 mcg) | 40-100 mcg | .00009 oz | 100 ppm; 500 mcg; 250%* |

Chromium is an essential nutrient required for normal glucose and fat metabolism and works primarily by ensuring insulin acts correctly. It is present in the entire body but with the highest concentrations in the liver, kidneys, spleen and bone. Chromium is needed for energy, as it maintains stable blood glucose levels. In cooperation with other substances, it controls insulin as well as certain enzymes. It is also required in synthesis of fats, protein and carbohydrates, and thus is important in regulating cholesterol. It competes with vitamin C and may be needed in larger amounts to combat adult onset diabetes. Yet this extremely important mineral was not even considered necessary for health until 1977!

It is important to note that only trivalent chromium (Cr03) is acceptable for human and animal ingestion. Hexavalent chromium (Cr06) is toxic. TERRAMIN® contains only trivalent chromium.

* One serving of TERRAMIN® makes available 250% of what many consider essential daily chromium amounts needed for adults.

| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
|--|-------------|------------------------|-------------------------|------------------------|-------------------------------|
| Cobalt | (Co) | (10-50 mcg) | uncertain | .000056 oz | 28 ppm; 140 mcg; 280%* |
| <p>A hyper-trace element that makes up part of vitamin B12. It helps maintain muscle tissue and regulates hypertension, activates certain enzymes, and helps blood production.</p> <p>Cobalt was found to be a key component of vitamin B12 in 1948. Grazing animals suffer in areas where there is little cobalt in the soil. Like other trace minerals, Cobalt has been depleted from our soils due to intensive farming and the overuse of NPK. Until the 1940's, most farmers returned essential minerals to the soil by mulching, adding manure, and crop rotation. Since modern farming, farm animals have needed to be supplemented. This implies that some people are likely underexposed to cobalt, such as vegetarians.</p> | | | | | |
| COMPOUND | SYMBOL | ESSENTIAL DAILY AMOUNT | TYPICAL DIET DEFICIENCY | AMOUNT IN AVERAGE BODY | AMOUNT IN TERRAMIN |
| Copper | (Cu) | (2-5 mg) | 2 mg | .0028 oz | 35 ppm; 175mcg; 4%* |
| <p>An important trace mineral that affects immunity, and has anti-infectant properties. Copper is required in the formation of hemoglobin, red blood cells, skin and bones. It helps with the formation of elastin as well as collagen - making it necessary for wound healing. Copper works closely with iron for these functions. Copper is a vital component of a number of essential enzymes. It is essential for energy production, connective tissue formation, iron metabolism, melanin formation and it also has an antioxidant function.</p> <p>Copper's role in nutrition and health has been known since 1925. Yet it did not become recognized by orthodox medical community as an essential trace element until 1996!</p> | | | | | |

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