Energy By Dr. John Fudens HMC DVM PH

Energy is what life is composed of and is the prized elixir that regulates the body. In today’s world and life style, low or lack of energy is one of the most voiced complaints by Americans. Our modern, fast paced life styles of heavy workloads mentally, emotionally and physically wear us down and deplete our energy reserves. There are many reasons why we, in general, have low energy and many ways we can keep our energy high.

Energy is derived from cellular activity. Body cells take macronutrients, like carbohydrates, protein, fat, along with air and water, and break them down to building blocks called sugars, amino acids, and fatty acids. These building blocks are transformed, chemically, into usable energy using catalysts like vitamins and minerals. Certain particles inside cells, called mitochondria, take these building blocks and combine them with oxygen to form adenosine troposphere (ATP). ATP is then given to cells for membrane transport, chemical synthesis and muscle contraction. In fact ATP is the basic component that sets off all energy cycles in the body.

Vitamins act as coenzymes in the enzyme systems of the body. They act to regulate metabolism and deficiencies of them can cause specific patterns of disease, scurvy and beriberi being only two examples. The fat soluble vitamins are A, E, D and the water soluble are C and all the B’s. Vitamin A is best taken as beta carotene which is the precursor (produces Vitamin A) so it is non toxic if taken in excess. If the body doesn’t need vitamin A the beta carotene is excreted. Vitamin D is not needed if you expose parts of the skin to the sun daily-the maximum needed is 15-20 minutes. Vitamin E (mixed tocopherols containing alpha, beta, gamma) 400-1000 units daily is the best.

Vitamin C is absolutely needed. Of the warm blooded mammals only humans, primates and guinea pigs cannot produce vitamin C so they must get it from external sources. The best source is the bioflavonoid complex which contains the full range of C substances. Being water soluble the time span in the body is only six hours so C should be taken 3-4 times daily to provide maximum coverage. For practical reasons 2-3 times a day is sufficient in most cases. Ascorbic acid is not desirable as it will cause digestive upsets and is only one small form of the complex.

The B vitamins should be taken, like vitamin C, 2-3 times daily. Usually they are sold as B-complex 100 or 150 mg strength.

Minerals act as catalyst (causing something to happen) in skeletal and soft tissue maintenance, water balance, regulatory functions, oxygen transport, neuromuscular transmission, acid-alkaline balance, blood clotting, and enzyme activity.

1. Calcium is the most abundant mineral in the body and is most needed in skeletal support and electrical impulse movement along nerve fibers.

2. Chromium is used in carbohydrate metabolism and glucose tolerance factor. Chromium works with insulin allowing the uptake of glucose into the cell and the release of energy from it. Inadequate chromium levels have been linked to fatigue and excess fat production.

3. Iron transports oxygen in the red blood cells and also supports enzymes in the Krebs/Citric acid cycle (major energy pathway in the body). Supplementation should be used only with medical supervision because there is concern with free radical pathology and excess iron levels.

4. Iodine is an essential mineral playing a key role in thyroid hormone production, regulating oxidation functions and metabolism of carbohydrates, proteins and fats. This is a big one with deficiencies leading to a form of goiter.

5. Magnesium works with calcium and is one of the fundamental minerals evaluated in nutritional medicine. Magnesium improves the energy levels in individuals with chronic fatigue syndrome. Illness, of any source, causes magnesium depletion which compounds the problem so supplementation is definitely needed in sick and recuperating people. Athletic performance is enhanced by magnesium particularly strength training and aerobic fitness by improving oxygen efficiency.

6. Potassium is important for heart strength. It works opposite sodium to regulate cellular fluid. It is positively charged and inside the cells (sodium being outside the cell wall) so it balances cellular fluid, helps muscle contraction, nerve transmission and conversion of glycogen to glucose. If there is kidney problems medical supervision is needed regarding potassium supplements.

7. Zinc is a cofactor for more than 200 enzymes and plays a very important role in human metabolism particularly muscle strength and endurance.

All minerals are best taken as chelated meaning combined with amino acids, micronized or in one of the soluble salts for better absorption and utilization.

Free radicals are molecules with unpaired electrons. Stable molecules have electrons in pairs, but if the electron loses its partner it becomes unstable and reactive and is called “free radical”. Free radicals steal electrons from stable molecules initiating a continuous destructive process. Excessive amounts of free radicals overwhelm the body and immune system, alter cell enzymes and metabolism and destroy healthy tissue. As enzymes are damaged energy production is diminished. Antioxidants provide protection against these free radicals and some of the most important ones (and certainly not the only ones) are vitamins A,C and E, zinc and coenzyme Q10.

 TO YOUR GOOD HEALTH

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