Nutrient of the Month: Strontium

The trace mineral strontium is abundant in nature and generally occurs in inorganic sulfate and carbonate forms. Different areas of the Earth have different strontium isotopes, and since it is stored in teeth and bones, typing of bone strontium can help identify humans’ geographical origins. Though not considered an essential nutrient, early research suggested that strontium levels in water may be inversely related to the incidence of dental caries and that it may help control processes of bone resorption. It is also employed in toothpastes and high-tech bone-supporting biomaterials, such as those used in bone grafts and tooth implants.

Strontium occurs naturally in sea water and in soil, and good plant sources include cabbage, parsley, grapefruit, nuts, asparagus, onion, carrot, tomato, dandelion, oranges, and cucumber.

Strontium is absorbed by the body in a manner comparable to that of calcium, and its effects appear to be mediated through a G protein-coupled receptor called the calcium-sensing receptor, further emphasizing the close relationship between these two minerals. Considering the functional similarities between calcium and strontium, it may be best to take them at separate times of day if they are used in supplemental form and to ensure that intake of essential calcium is greater than that of not-as-essential strontium. In the book *Your Bones*, Lara Pizzorno, MA, LMT explains the differences among natural, pharmaceutical, and radioactive forms of strontium and details the good safety profile of naturally-occurring ones.

Aging, genetic predisposition, lifestyle factors, and disease can alter the balance between breakdown of bone for remodeling by osteoclasts and the building of new bone by osteoblasts. Bone structure, strength, and flexibility rely on both bone mineral...
density (BMD) and organic bone matrix proteins, and appropriate nutritional balance among the minerals that populate bone is important. Strontium may help contribute to bone integrity, increasing BMD when bone anabolic processes are impaired by hormonal imbalance, aging, disease, genes, or behaviors such as smoking, drinking carbonated beverages, or excessive alcohol intake. In one study, women receiving a strontium-containing dietary supplement over a 7-year period showed steady increases in BMD of about 1% per year, in contrast to the loss in BMD that is common enough to be considered normal.

While strontium supplementation emphasizes osteogenesis and increases bone mineral density, it may also beneficially affect bone matrix proteins. In an animal model, strontium supplementation was found to enhance the differentiation of stem cells into osteoblasts and to improve bone quality through activating and upregulating extracellular matrix proteins, an impressive combination of effects. Yet its influence may extend still further: in aging, as happens within skeletal muscle, bone marrow is often infiltrated with lipid which reduces its strength, but preclinical research finds that strontium may alter lipid signaling and interfere with fat cell development, thereby reducing fatty accumulation in bones.

Resource Spotlight: EAFUS (Everything Added to Food in the US) Database

How much glyphosate is allowable? Can acrylamide be added to foods? What is this new ingredient with a long weird name? This database on EAFUS (Everything Added to Food in the US) is where the FDA lists food additives under evaluation for the US food supply. While being listed does not imply FDA acceptance or full safety testing, those substances mentioned within US regulations are indicated under the “REGNUM” (regulation number) column, allowing consumers to view the specific circumstances under which the use of given substances has been approved. These regulation numbers refer to parts of the Code of Federal Regulations, which may be searched by number or by substance name. The searchable version is updated yearly while the electronic version of the CFR is updated almost daily, and Title 21 is the portion dealing with food and drug regulations. The FDA database on substances Generally Recognized as Safe (GRAS) for use in foods can also be useful for examining publicly-available safety data on new food ingredients and learning who submitted the information.

As a practical example, searching for ‘glyphosate’ reveals that 0.7 milligrams per liter of this pesticide is allowable in bottled water—in fact, the highest allowable level among pesticides listed, though this same bottled water regulation states that the essential nutrients iron, selenium, and manganese are legally restricted to lower levels: 0.3, 0.05, and 0.05 milligrams per liter, respectively. Entering the search term ‘acrylamide’ into the CFR database shows that it may be used in or on foods in several different applications. The GRAS database demonstrates that in March 2018, a Chinese company achieved the right to add up to 20 milligrams per serving of its new pyrroloquinolone quinone ingredient (used for performance, energy, and redox balance) to beverages and meal replacements—and that two other Chinese and two American companies have also had PQQ ingredients accepted within certain dosage and usage limits.

These databases not only inform the public about which substances are allowable within foods, they also provide some insight into the subjective and objective ways substances are evaluated—some (like PQQ) fairly rapidly deemed suitable while others like stevia leaf extracts and isolates went through long processes before certain preparations were allowed.
ICD11 Begins to Redefine What Constitutes a "Disease"

The June 2018 International Classification of Diseases (ICD-11) is, simply put, a phenomenon. It provides thousands of new disease classifications and codes, and is expected to be in common usage within a few years. The previously ubiquitous “not otherwise specified” is increasingly replaced with detail, and though it is a lot to assimilate, it undoubtedly welcomes the new era of understanding illness (if not wellness) at a more granularized and individualized level. It provides more detailed clinical descriptions that may be used to help personalize treatment and develop more accurate prognoses, and in addition, it will help define who responds, doesn’t respond, or adversely responds to common pharmaceutical treatments. It further begins to capture generalized or poorly recognized conditions like chronic fatigue and fibromyalgia and “mental” disorders that manifest physically. Though primarily aimed at medical coding for billing purposes, the broader scope of ICD-11 will facilitate a more functional categorization of phenotypical presentations, eventually leading to better understanding of disease and wellness (including their genetic and epigenetic bases) and more personalized therapeutics. The following August 2018 Lancet article provides background and presents potential benefits to implementing ICD-11.

Read more: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(18)30436-5/fulltext

Really Caring—With Medically-Tailored Food

Though relatively simple, there is something futuristic about specialized frozen meals and fresh foods being delivered weekly as part of a private Medicaid program. For a patient with congestive heart failure, buckets of dumplings and fajitas, prepared with controlled salt and carbohydrate levels, were provided. Those with diabetes, cancer, or kidney disease—as well as all their family members—are supplied with sweet potato-and-crab soup, whole-grain bagels with hummus, or other low-calorie, high-calorie, high-protein, or otherwise condition-specific foods. In the Philadelphia area, a community program known as MANNA, carried out by a local non-profit group, has given over 2000 people over half a million meals, in the name of improving health through lifestyle. It also provides nutrition education, which enables participants to make better dietary choices that improve health outcomes while lowering care costs. At a daily per-patient cost of about $15, it may represent a better investment than many drugs, and the program has thus far been picked up by at least 3 insurers in the region. While putting food first may seem novel to those used to seeing doctors to get prescriptions, among those receiving intensive or high-priced care, a nutritional approach may better control hospitalization costs. Especially in food deserts where healthy foods are not commonly available, “prescription” food represents no less than a lifesaving and cost-effective revolution.
