DIRT POOR

Why We Need a **Micronutrient Bailout** for Mineral Depletions

IT IS HARD TO BELIEVE in this modern day world that our planet's food supply might not be as nutritious in vital minerals as it was 50 years ago. And that in regions of the world with ample food, populations may be unknowingly over fed and undernourished. It's a very real scenario.

The problem is, our soil is depleted of many of the vital nutrients it needs. This is compounded by modern day life, which gets in the way of healthy eating. Add to this, medications can lead to mineral depletions. And, many of the processed foods and supplements we rely on to replenish the body don't use the right form for the most bioavailability.

It's a situation we call **DIRT POOR**. And we aim to change it.

CYPRESS
OUR SCIENCE IS GOLDEN

BANKRUPT NUTRIENT SUPPLY IN THE WESTERN DIET

Just how bad is the problem of mineral deficiencies?

IT'S A PROBLEM FOR EVERYONE. It might sound like an exaggeration, but nearly every American consumes less than the Estimated Average Requirement (EAR) intake for vitamins and minerals.[1] Even half of all supplement users fall short of vitamin and mineral intake. Similarly in Europe, researchers have found that micronutrient deficiencies in the diet are leading to poor health and rising susceptibility to disease.[2]

DIRT POOR TALLY IN AMERICA[3]

88% don't get enough zinc

56% fall short of calcium

48% are low in magnesium

40% overall, Americans get inadequate intakes of vitamin A, vitamin C, vitamin D, vitamin E, calcium, and magnesium.

The evidence is becoming alarmingly clear as scientists discover that small deficiencies in even one mineral can have a cascading affect. The leading expert, Dr. Bruce Ames of the Nutrition and Metabolism Center at the Children's Hospital of Oakland Research Institute, has made a connection between micronutrient deficiencies – especially trace minerals like selenium – in the rising rates of age-related diseases and cancer.

Ames well-known triage theory shows how the body needs roughly 40 substances, including 15 minerals that need 15 coenzymes to function properly, along with essential fatty acids and amino acids.[4] When any one of these is insufficient, such as Dirt Poor Tally list shows, the body makes a priority decision to apply whatever nutrients are available toward survival and reproduction. As a result, DNA repair for longevity and chronic disease reduction gets the short straw.

Ames explains: "With limited nutritional resources, the human physiology must 'decide' which biological functions to prioritize in order to give the total organism—and the species—the best chance to survive and reproduce. My work suggests that if you're even modestly deficient in one of the essential micronutrients, your body has to "ration" them in terms of priority. Under this scenario, the body will always direct nutrients toward short-term health and reproductive capability—and away from regulation and repair of cellular DNA and proteins that increase longevity."[5]

> "THIS SUGGESTS YOU'RE PAYING A PRICE ANY TIME YOU GET A LITTLE LOW ON ANY VITAMIN OR MINERAL," SAYS AMES.

Ames work supports the concerns from larger agencies like the Center for Disease Control that even small deficiencies in minerals may increase the risk of age-related diseases and cancer. In 2012, the CDC expressed these concerns:

"…recent findings have determined that less than optimal biochemical concentrations (representing suboptimal status) have been associated with risks of adverse health effects. These health effects include cardiovascular disease, stroke, impaired cognitive function, cancer, eye diseases, poor bone health, and other conditions."[6]

OUR DIRT POOR AND MINERAL ENVIRONMENT

Getting to the root cause of the problem

EVEN IF OUR DIETS WERE a model of perfection – with plenty of fruits and vegetables, whole grains and nuts and seeds and modest animal proteins – it may not be enough to get all the minerals one's body needs. In this dirt poor world, even our desire to eat healthfully is in conflict with modern farming methods that deplete the soil of minerals and nutrients.

In the past 50 years, global farming practices have focused on crop size and higher yields rather than nutritional value. The ongoing disparity between soil nutrient concentration and ideal nutrient consumption patterns is slowly ticking away at our body's ability to fend off chronic diseases.

Studies show that micronutrients like magnesium, copper, zinc and selenium are being depleted in farms without adequate replenishment. For instance, over a hundred-year period, zinc levels in soil have diminished in some regions by nearly 20% without efforts to replenish.[7]

Dr. Donald Davis, a biochemist from the University of Texas at Austin has published compelling findings on this subject. In analyzing data from the U.S. Department of Agriculture, Davis discovered that of the 13 major nutrients found in fruits and vegetables, six, including calcium, protein, vitamin C, phosphorus, riboflavin and iron, are as much as 38 percent lower in current produce compared to produce from several decades earlier.

Research in the United Kingdom shows fruits and vegetables have significantly less copper, iron and potassium than they did in the 1930s. Agricultural researchers in the United Kingdom say, "Due to our reliance on synthetic mineral fertilizers,

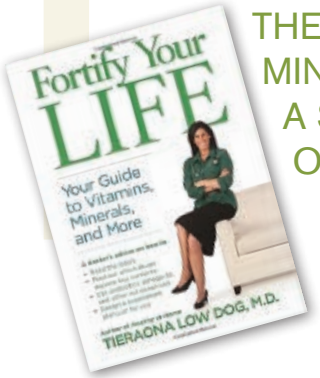
THE PROBLEM OF MINERAL DEFICIENCIES IS REAL. It has known health implications for adults, children and infants. The good news is that it's possible to turn this around. With the better understanding of the most bioavailable food forms of minerals, your company can play a role in digging us out of our Dirt Poor condition.

intensive agriculture seems to have lost sight of how crops can acquire nutrients from their natural environment."[8]

The declining nutrient tally adds up when one considers other factors like exposure to toxins and drug interactions. The body needs adequate levels of minerals to reverse the adverse effects of agricultural and commercial chemicals. The evidence is alarming, according to experts like Tieraona Low Dog, MD, integrative physician, Fellowship Director for the Academy of Integrative Health and Medicine, and author of, *Fortify Your Life*.[9]

She outlines in *Fortify Your Life* scenarios whereby patients and doctors are unaware of the risk of nutrient depletions from commonly prescribed drugs. For instance, millions take proton pump inhibitors for heartburn, but know nothing of the FDA black box warning that PPIs increase the risk for bone fractures and magnesium depletions. Or that ace inhibitors and thiazide diuretics for blood pressure deplete the body of zinc.

"THE LIST GOES ON AND ON," LOW DOG SAYS. "MOST PATIENTS TAKING THESE DRUGS HAVE NEVER BEEN CHECKED FOR SPECIFIC NUTRIENT DEFICIENCIES, AND NO CLINICIAN HAS TOLD THEM TO INCREASE THEIR DIETARY INTAKE OF FOODS RICH IN THESE VITAMINS/MINERALS, TAKE A SUPPLEMENT OR BOTH."



ORGANICALLY BOUND MATERIALS

IT IS NOT LIKELY THAT global farming will or can quickly bring back soil nutrient values to their pre-mid 20th century levels. Mineral supplementation is a valid strategy to address these growing insufficiencies. However, not all mineral supplements are created equally.

THERE ARE LIMITED WAYS for humans to obtain the most bioavailable minerals – 1. through plants, 2. from meats (animals who eat plants), or 3. 100% organically bound, fermented mineral supplements.

LEAVES

3. This process transforms the inorganic minerals into ionic forms, which creates a highly bioavailable nutritious form of organic minerals for humans and animals. When animals and humans consume plants the body knows exactly how to use the minerals within these plants for vital bodily processes.

STEM

2. The mineral combines with water and both are pushed through the plant's cells in the stems and leaves.

ROOTS

1. Plants absorb inorganic forms of mineral from soil through root hairs. These inorganic minerals are the ideal natural food for plants, but they are not bioavailable to humans in this form.

BANK ON FOOD FORM MINERALS

Food-form minerals provide long-term health equity

IN THE WORLD OF MINERALS, how the mineral is produced makes a dramatic difference in bioavailability. Organic minerals from plants, as opposed to inorganic minerals found in soil and water, provide the most benefits to human health. An emerging body of research shows that yeast-enriched mineral supplements mimics how plants produce organic minerals. This is proving to be the best way to get highly bioavailable minerals that are closest to the type nature produces in plants.

IF DIET ALONE CANNOT ADDRESS ideal mineral intake, nutritional supplementation is necessary. However, some supplements use synthetic and other forms of minerals that cannot be utilized by the body. This distinction is significant to human health.

Whole food-form mineral supplements made using microbial cultures, such as *Saccharomyces cerevisiae*, replicates the natural process found in plants. These supplements are a superior food form that the body can readily use.

HEALTH IS WEALTH FOR FOOD FORM MINERALS

Fermentation Process Ensures More Bioavailability

AS MENTIONED, WHOLE FOOD FORM supplements are the best way for the human body to obtain highly effective minerals. The form of these minerals makes a significant difference in bioavailability and thus human health. Manufacturing processes that replicate the plants natural ability to transform inorganic minerals from the soil to a protein bound food form is the gold standard for minerals. The process uses *Saccharomyces cerevisiae*, better known baker's yeast.

BAKER'S YEAST PROCESS

Fundamentally, the baker's yeast helps replicate the plant's natural process as described here:

1. The inorganic mineral is placed in a *broth* of carbohydrates and other nutrients.

2. The *S. cerevisiae* actively grows and ferments, which transforms the mineral into a highly concentrated food form.

3. Once the fermentation and mineral uptake process is completed, the mineral yeast cream is pasteurized and spray dried to retain all the nutritional properties within the mineral and to deactivate the yeast.

4. *S. cerevisiae* is a non-pathogenic yeast that is rich in various minerals, amino acids, B-vitamins, carbohydrates and enzymes. Studies show that *S. cerevisiae* adds additional health properties, such as improved digestive health and a possible therapy for inflammatory bowel disease. [10]

5. Supplement made with S. cerevisiae contain host proteins that chaperone the minerals directly to cell receptors. See Table 1 for more on why this dramatically improves bioavailability.

MINERAL SUPPLEMENT BIOAVAILABILITY

Fermented Food Form is Preferred

THE CASE IS ALSO STRONG that food-form nutrients produced using a fermentation process are better absorbed and retained longer than supplements produced using a synthetic chemical process. As an example, researchers now realize rising deficiencies in nutrients, such as chromium, magnesium, selenium and zinc may be at the root of the increasing rates of chronic health issues of heart disease, diabetes, arthritis and cancer.[11]

As our understanding grows of how vitamins and minerals affect systems in the body, it is becoming increasingly clear that naturally produced minerals that mimic whole food forms, such as those enriched with yeast, provide more bioavailable and efficacious options (see Table One). These natural supplements contain co-factors that assist their uptake in the body by reproducing the nutritional qualities found in whole food sources.

TABLE 1 *Nutrient Relative* BIOAVAILABILITY COMPARISONS[12]

YEAST SELENIUM **122%** *blood* **226%** *liver*	**CHELATED SELENIUM** **60%** *blood* **146%** *liver*
YEAST ZINC **172%** *blood* **187%** *liver*	**CHELATED ZINC** **101%** *blood* **129%** *liver*

THE YEAST DISCONNECT

Why S. cerevisiae *is a helpful and healthful yeast*

A COMMON MISUNDERSTANDING about *S. cerevisiae* is that because it is a yeast, it must be harmful or even an allergen. This couldn't be further from the truth.

While some yeasts like Candida albicans are very pathogenic and can lead to health problems, particularly in women, *S. cerevisiae* is a nonpathogenic yeast. It's the same yeast used to make bread, beer, wine and spirits.

And while books like the *Yeast Connection* by William Crook, MD raised concerns about pathogenic yeasts, there is no reason for consumers or food and supplement manufacturers to be concerned about the safety of using *S. cerevisiae* to replicate nature's process of transforming inorganic minerals to a food form.

Jack D. Sobel, MD, professor of Medicine at Wayne State University's Department of Immunology and Microbiology, Obstetrics and Gynecology and Internal Medicine, is a leading authority on Candida yeast-based infections and corroborates that this connection is incorrect. Calling the nutritional yeast *S. cerevisiae* a non-pathogenic organism, Sobel has noted that labeling yeast as an allergen is irrational and also discounts the theory that yeast-free diets are helpful for patients with problems related to Candida albicans.

HIGH SELENIUM YEAST

RESEARCH COMPARING the differences between minerals enriched with yeast versus those that aren't provides a compelling case that these food form supplements are not only more bioavailable, but may also play a role in health and disease prevention in their own right. Selenium is a case in point. While it may not be as well-known as other vitamins and minerals, it is one of the most researched nutrients for its efficacy. Selenium-enriched yeast from Cypress Systems represents one of the best absorbed forms.

This micronutrient also has compelling evidence for its role in immune support, healthy inflammatory response and is the only mineral approved for a qualified general health claim for a reduction of cancer incidence.[13] As such, it is already leading the way in our understanding of how minerals play an important role in body functions and in our prospects for overall health and longevity.

CONCLUSION

VITAMINS AND MINERALS are essential for human health and provide an elemental force in how the body functions. However, the evidence is growing that diet alone, for the foreseeable future, will not be adequate to address the growing rates of vitamin and mineral deficiencies in the global population. Several factors are contributing to this problem. The prevailing Western Diet is lacking in nutrient-rich foods. But even those who endeavor to consume enough minerals and trace elements in their diet will find it difficult to do so. Modern agricultural practices have depleted the soil of critical organic complexes, which is leading to crops that are now lower in these valuable, health promoting nutrients. Researchers now realize rising deficiencies in nutrients, such as chromium, magnesium, selenium and zinc may be at the root of the increasing rates of chronic health issues of heart disease, diabetes, arthritis and cancer.[14] And mineral supplements that mimic the whole food form are the ideal solution to this growing problem of nutrient depletions and our Dirt Poor nation.

High Selenium Supplement
Seleno Excell®

Nutritional Yeast Supplement
GTF Excell®

CYPRESS SYSTEMS MINERALS AND NUTRITIONAL YEAST PRODUCTS

MINERALS	FUNCTION	FORM	ADDITIONAL BENEFITS
SelenoExcell®	Participates in antioxidant activity and redox-state regulation. Insufficient Se-protein levels are associated with several human diseases including cancer, cardiovascular and immune system disorders.	Food-form of the mineral introduced in the protein structure of a pure Saccharomyces cerevisiae culture during fermentation. It contains 21 organic selenium compounds that create a unique profile.	FDA qualified health claim*,SelenoExcell® is the only form recognized as 100 percent organically bound form of high-selenium yeast, and was standardized with the National Cancer Institute.
GTF Excell® Chromium Yeast 250	Vital to insulin function, the hormone that orchestrates the use of fuels from carbohydrates, fats, and proteins. It enhances the action of insulin, by increasing sensitivity and uptake of blood sugar by the cells. The liver needs Cr to produce fatty acids, lecithin, cholesterol, and lipoproteins.	Pure culture of a Saccharomyces cerevisiae yeast strain, optimized to create the natural food-form of Cr known as Glucose Tolerance Factor (GTF). Food-form of the mineral introduced in the protein structure of a pure Saccharomyces cerevisiae culture during fermentation. It contains food-form of chromium known as Glucose Tolerance Factor (GTF).	Favorable blood sugar changes and lipid profile improvement were observed in a group of human subjects in a 2011 study in which Cr yeast was used as intervention agent.

CYPRESS SYSTEMS PROVIDES a fully developed portfolio of fortified yeast products. In addition to SelenoExcell and GTF Excell Chromium, our NutraFeast product line includes High Yeast Chromium, Copper, Iron, Manganese, Magnesium, Molybdenum, Zinc and blends.

**Selenium may reduce the risk of certain cancers. Some scientific evidence suggests that consumption of selenium may reduce the risk of certain forms of cancer. However, FDA has determined that this evidence is limited and not conclusive.*

HELP YOUR CUSTOMERS DIG OUT OF THEIR DIRT POOR NUTRITION SITUATION

AFTER 20 YEARS OF EXPERIENCE, Cypress Systems continues to offer food form minerals and nutritional yeast products that address the growing need for scientifically tested, high quality, GMP compliant nutritonal ingredients.

Cypress Systems is the pioneer in high selenium yeast clinical science and a standardized formulation that is entursted to the National Cancer Institute.

For the health of your customers, Cypress Systems is here to provide the highest quality minerals available on the market today.

Cypress Systems, makers of SelenoExcell®, Chromium GTF Excell®and a full line of NutraFeast nutritional yeast products.

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