

CELLULAR MICRONUTRIENT ASSAY (CMA)

VITAMINS

Biotin		128% Insufficient	Vitamin B2	
Delta tocotrienol			Vitamin B3	
MK4			Vitamin B6	
MK7			Vitamin B9	
Pantothenic acid			Vitamin C	
Vitamin A			Vitamin D	
Vitamin B1			Vitamin K1	
Vitamin B12				

MINERALS

Boron			Magnesium	
Calcium			Manganese	
Chromium			Molybdenum	
Copper			Selenium	
Iodine			Strontium	
Iron			Vanadium	
Lithium			Zinc	

AMINO ACIDS

Arginine		111% Borderline	L-Tyrosine	
Asparagine			Lysine	
Cysteine			Methionine	
Glycine			Phenylalanine	
Histidine			Taurine	
Isoleucine			Threonine	
Leucine			Tryptophan	
L-Glutamine			Valine	
L-Serine				

OTHER NUTRIENTS

Carnitine			Lipoic Acid	
Choline			Omega 3 DHA	
Coenzyme Q10			Omega 3 EPA	
Glutathione		116% Borderline	Omega 9	
Inositol		118% Borderline		

	100% - 109%		Nutrient Sufficiency
	110% - 119%		Borderline Insufficiency
	≥ 120%		Insufficiency*

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MICRONUTRIENTS TO ADDRESS

- ▶ **Biotin** Biotin is an essential B vitamin also known as vitamin B7. **Important for:** • The conversion of carbohydrates, proteins and fats into energy. • Health of skin, nails, eyes, liver, and nervous system. **May be useful for the prevention/treatment of:** diabetes, brittle nails, seborrheic dermatitis of infancy, MS, and uremic neuropathy **Good food sources:** meat, fish, egg yolks, liver, poultry, dairy products, seeds, nuts, sweet potatoes, spinach, and broccoli
- ▶ **Selenium** Selenium is an essential trace mineral found in soil, water, and some foods. **Important for:** • Antioxidation • Anti-inflammatory • Immune function enhancement • Antiviral • Reproductive support • Thyroid hormone metabolism • DNA synthesis **May be useful for the prevention/treatment of:** burns, depression, certain types of cancer, cardiovascular disease, CHF, dementia/cognitive decline, Down syndrome, hepatitis, male infertility, lymphedema, myotonic dystrophy, oral leukoplakia, Osgood-Schlatter, and thyroiditis **Good food sources:** seafood and organ meats. Brazil nuts, sunflower seeds, brown rice, shiitake mushrooms, chia seeds, lima beans, cabbage, spinach
- ▶ **Inositol** Inositol is structurally similar to glucose. It was once considered to be part of the B vitamin complex but now known to be produced in the human body so is now referred to as a pseudovitamin. Inositol is present in two forms, myo-inositol and D-chiro-inositol. **Important for:** • Cell membrane components, cell signaling • Lipoprotein components • Proper function of hormones • Possibly enhancing insulin sensitivity **May be useful for the prevention/treatment of:** Alzheimer's disease, bronchopulmonary dysplasia (BPD), depression, diabetes (d-chiro inositol)/gestational diabetes, NAFLD, OCD, panic attacks, and PCOS **Good food sources:** whole grains, buckwheat, peanuts, legumes, nuts, seeds, grapefruit, other citrus fruits, and cantaloupe
- ▶ **Lysine** Lysine is an essential amino acid that plays an important role in the production of enzymes and hormones, as well as the growth and development of bones and muscles. **Important for:** • Building muscle protein • Increasing collagen production and tissue repair • Supporting the production of enzymes, antibodies, and hormones • Promoting calcium absorption • Immune support **May be useful for the prevention/treatment of:** recurring herpes simplex infections/cold sores, diabetes, high triglycerides, and stress **Good food sources:** Meat, fish, poultry, dairy, eggs, soybeans, and legumes. Note: a significant amount of lysine is destroyed by harsh cooking techniques like high temperature baking, grilling, and frying.
- ▶ **Molybdenum** Molybdenum is an essential trace mineral. It serves mainly as a cofactor for over 50 enzymes and aids in the metabolism of proteins and the production of genetic materials. Humans need only very small amounts of molybdenum, which are easily attained through a health promoting eating pattern. **Important for:** • The breakdown of toxic substances • Antioxidation and anti-inflammatory support • Liver and digestive support **May be useful for the prevention/treatment of:** asthma, chronic aches and pains, sulfite and chemical sensitivities, allergies, insomnia, tooth decay, MS, lupus, eczema, and gout. **Good food sources:** Legumes, lentils, nuts, grains, cheese, organ meats
- ▶ **Glutathione** Glutathione is produced in the liver from the amino acids, glycine, cysteine, and glutamic acid. It is considered the body's "master antioxidant". **Important for:** • DNA synthesis and repair • Metabolism of toxins and carcinogens • Immune support • Prevention of oxidative cell damage • Protein and prostaglandin synthesis • Transport of amino acids • Antioxidation, -fights free radicals • Antiviral • Anti-inflammation **May be useful for the prevention/treatment of:** cancer, Parkinson's disease, neurodegenerative disorders, flu, AMD, glaucoma, cataracts, diabetes, heart disease, asthma (not inhaled glutathione), lung disease, liver disease, GI disease, CFS, and side effects of chemotherapy **Good food sources:** Fruit, vegetables, and meat but glutathione is poorly absorbed from the GI tract. Consuming foods used in cysteine production is recommended- onions, garlic, chives, leeks. Supplementing with N-acetyl L Cysteine can boost glutathione levels. Glutathione can be taken IV or in liposomal supplemental form.

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MICRONUTRIENTS TO ADDRESS

- ▶ **Vitamin K1** Vitamin K is a general name of a family of compounds with a common chemical structure-Vitamin K1 (phyloquinone or phytanadione), vitamin K2 (menaquinone), and vitamin K3 (menadione- no longer used in fortified foods/supplements). Vitamin K1 is the primary source of vitamin K that humans obtain through foods. **Important for:** • Regulation of blood clotting • Transport of calcium and bone metabolism • Potential antioxidant protection, and insulin sensitivity support, protection of cells lining blood vessels **May be useful for the prevention/treatment of:** atherosclerosis/ischemic heart disease, nausea hemorrhagic disease of newborns, vomiting of pregnancy, and osteoporosis **Good food sources:** green tea, leafy greens such as kale, turnip greens, and spinach, broccoli, Brussels sprouts, asparagus, cabbage, other vegetables.
- ▶ **Manganese** Manganese is an essential mineral which plays a role in the production of cartilage and bone matrix. Although important for maintaining good health, manganese can be toxic at high levels. **Important for:** • Metabolic and enzymatic reactions to process carbohydrate, amino acids, and cholesterol • Bone and cartilage health and development • Antioxidant function • Wound healing • Collagen formation **May be useful for the prevention/treatment of:** osteoporosis, epilepsy, tardive dyskinesia, and sexual dysfunction in females. **Good food sources:** Cloves, whole grains, tea, nuts, seeds, legumes, and leafy green vegetable, cinnamon, berries, garlic, basil
- ▶ **Arginine** L-arginine is an amino acid, a building block for protein synthesis, and is best known for its effects on the vascular system. **Important for:** • Vasodilation – dilatation and relaxation of blood vessels • Wound healing and enhancement of the immune system • Ammonia detoxification **May be useful for the prevention/treatment of:** anal fissure, congestive heart failure, erectile dysfunction, pre-eclampsia, sickle cell disease, esophageal spasm, infertility, interstitial cystitis, and Raynaud's disease **Good food sources:** meat, poultry, fish, dairy products, peanuts, nuts, seeds, whole grains, legumes, and chocolate.

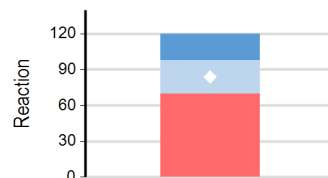
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REDOX SCORE

The Redox Score is an indication of your resistance to oxidative stress, relative to the general population. An average or below average response can be improved by appropriate use of nutrients and antioxidants as determined by the Antioxidant Protection Assay and guidance from your practitioner.

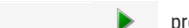
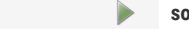
84

Above Average
Normal Range
Below Average



ANTIOXIDANT PROTECTION ASSAY (APA)

Antioxidants / Anti-inflammatories

Acai Berry		Lycopene	
Andrographis		Maitake	
Astaxanthin		Mangosteen	
Astragalus		Melatonin	
Beta-Carotene		Milk Thistle	
Bilberry		Moringa	
Boswellia		NADH	
Camu Camu		Noni Berry	
Catalase		Piperine	
Chlorophyll		Pomegranate	
Cinnamon		Pycnogenol	
Coenzyme Q10		Pyrroloquinoline	
Delta tocotrienol		Quercetin	
Echinacea		Resveratrol	
Elderberry		Rhodiola	
Garlic		Selenium	
Ginger		Shiitake	
Ginkgo Biloba		SOD	
Glutathione		Sulforaphane	
Goji Berry		Turmeric	
Grape Seed		Vitamin C	
Green Tea		Wild Cherry Bark	
Lavender		Zeaxanthin	
Lipoic Acid		Zinc	
Lutein			

	≥ 120%	provides high protection against oxidative stress
	110% - 119%	some protective effect against oxidative stress
	100% - 109%	no significant protective effect

*The term **protective** describes the cell protection effect, i.e. the individual benefit of a specific nutrient to increase the antioxidative capacity

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Beneficial Antioxidants

- ▶ **Piperine** Piperine is the major bio-active component of black pepper. **Important for/potential beneficial properties:** • Antibacterial • Blood glucose support • Antifungal • Antioxidation • Antiparasitic • Anticancer • Diuretic • Cognitive Support • GI Support/Antiflatulent • Hepatoprotective • Insecticidal • Metabolic Support **May be useful for the prevention/treatment of:** • Diabetes • Vitiligo • Cognitive decline • Overweight/Obesity • Parasitic infection • Nutrient bioavailability enhancement **Sources:** Supplemental from- capsules, tablets. Essential oils.
- ▶ **Ginkgo Biloba** Ginkgo biloba is a large tree with fan-shaped leaves with radiating veins . It is one of the oldest living tree species in the world. Native to temperate Asia, including China, Japan, and Korea, but is now cultivated in Europe and the United States. It is the last remaining species of a primitive family of gymnosperms called Ginkgoaceae. **Important for/potential beneficial properties:** • Anticancer • Anticoagulant/antiplatelet • Blood glucose support • Anti-inflammation • Antimicrobial • Antioxidant • Cardiovascular support • Lipid lowering • Neurological support **May be useful for the prevention/treatment of:** • Anxiety, Alzheimer's disease, mixed dementias, PMS, schizophrenia, tardive dyskinesia, vertigo, AMD, altitude sickness, metastatic colorectal cancer, depression, diabetic retinopathy, dyslexia, fibromyalgia, gastric cancer, glaucoma, hemorrhoids, ovarian cancer, PAD, Raynauds syndrome, vitiligo **Sources:** tea and extracts supplementation via tablets and capsules
- ▶ **Coenzyme Q10** Coenzyme Q10 is a fat-soluble compound that is synthesized in the body with the highest levels in the heart, liver, kidneys, and pancreas. It is present in small amounts in some foods. It's chemical structure is similar to vitamin K. **Important for/potential beneficial properties:** • Antioxidation • Analgesic • Membrane stabilization • Anti-aging • Anti-inflammatory • Cofactor in energy synthesis • Immune support **May be useful for the prevention/treatment of:** mitochondrial dysfunction, Alzheimer's disease, AMD, eye disorders, cardiovascular disease, CHF, cardiomyopathy, myocardial infarction, hyperthyroidism, infertility, neuropathy, fibromyalgia, hypertension, migraines, NAFLD, Parkinson's disease, Huntington's disease, pre-eclampsia, PCOS, and respiratory illness **Sources:** As supplements, there are two forms of CoQ10 that are available, the oxidized form (ubiquinone) and the reduced form (ubiquinol) . Food sources include meat, poultry, fish, soy, nuts, fruit, vegetables, eggs, and dairy.
- ▶ **Mangosteen** Mangosteen is a tropical fruit cultivated in Southeast Asia. The fruit, fruit juice, rind, twig, and bark are used as medicine. **Important for/potential beneficial properties:** • Antioxidation • Anti-allergy • Antibacterial • Anti-inflammatory • Antiviral • Immune support • Astringent • Free radical scavenger **May be useful for the prevention/treatment of:** diarrhea, UTIs, gonorrhea, thrush, tuberculosis, cardiovascular issues, menstrual disorders, cancer, osteoarthritis, dysentery, and skin issues **Sources:** mangosteen fruit, supplemental form
- ▶ **Milk Thistle** Milk thistle, also known as Silymarin (the main active ingredient), is a plant native to Europe and brought to North America by early colonists. It is now found throughout the US. Milk thistle gets its name from the milky sap that is released from the leaves. The applicable parts of milk thistle are the seeds and above ground parts. **Important for/potential beneficial properties:** • Antioxidant • Anticancer • Insulin sensitivity support • Anti-inflammatory • Antilipemic • Antiviral • Hepatoprotective • Renal protective **May be useful for the prevention/treatment of:** Liver disorders, skin damage caused by radiation, diabetes, indigestion **Sources:** In foods, milk thistle leaves and flowers are eaten as a vegetable and seeds are roasted for use as a coffee substitute. May be consumed as tea and in supplemental form as well.
- ▶ **Sulforaphane** Sulforaphane is a chemical (isothiocyanate) made during the chewing of cruciferous vegetables, especially broccoli and broccoli sprouts. Sulforaphane is produced when glucoraphanin, a constituent of cruciferous vegetables, interacts with myrosinase, an enzyme that occurs naturally in these plants and in human gut microbiota. **Important for/potential beneficial properties:** • Anti-cancer • Antimicrobial (antibiotic) • Anti -allergic • Neurological support • Respiratory support • Cardioprotective • Antioxidant • Anti-inflammatory • Detoxification support- phase 2 **May be useful for the prevention/treatment of:** Cancer- particularly prostate, liver, and leukemia, H-pylori, cardiovascular disease. **Sources:** cruciferous veggies (cauliflower, kale, cabbage, collards, brussel sprouts, radish, mustard) especially broccoli and broccoli sprouts

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Beneficial Antioxidants

- ▶ **Lavender** Lavender is a perennial evergreen plant that is native to countries in the Mediterranean region. The applicable parts of lavender are the flowers, leaves, and oil. **Important for/potential beneficial properties:** • Analgesic • Antibacterial • Anticancer • Lipid reduction • Antifungal • Anti-inflammatory • Hair growth • Neurologic/CNS effects- relaxation, sedation • Wound healing **May be useful for the prevention/treatment of:** anxiety, depression, stress, psychological well-being, dysmenorrhea, pain, intestinal problems, and high cholesterol **Sources:** capsules, via aromatherapy, and topically
- ▶ **Beta-Carotene** Beta-Carotene is a pigmented, fat-soluble compound called a carotenoid. It is converted in part to vitamin A in the body. It is converted to retinal which is essential for vision. Then converted to retinoic acid, it is used in growth and cell differentiation. **Important for/potential beneficial properties:** • Anti-inflammatory • Antioxidant • Tumor cell growth inhibition • Cardiovascular protection • Immune enhancing **May be useful for the prevention/treatment of:** cognitive decline, dementia, AMD, breast cancer, GERD, sunburn, retinitis pigmentosa, erythropoietic protoporphyria, rash from sun exposure, and signs of aging **Sources:** green leafy vegetables-spinach, kale, collard greens, orange-yellow fruits and vegetables- sweet potato, carrots, pumpkin, squash, cantaloupe, bell peppers, broccoli, asparagus
- ▶ **Green Tea** Green tea is derived from the plant, Camellia sinensis. Green tea extract is simply green tea leaves prepared as a supplement. Green tea and its extracts, such as ECGC (Epigallocatechin gallate), a polyphenol, have been studied for their antioxidant effects and possible protective impact against heart disease and cancer. **Important for/potential beneficial properties:** • Immune support • Anti-inflammatory • Antioxidant • Anticoagulant/antiplatelet • Blood glucose regulation • Antilipemic • Antiviral • Bone support • Regulation of blood pressure • Protective against certain types of cancer • Stimulation of CNS • Improved cognitive performance • Reduction in dental plaque • Diuretic • Enhancement of muscular endurance in exercise • Increase in calorie and fat metabolism **May be useful for the prevention/treatment of:** elevated blood pressure, high cholesterol, heart disease, Insulin resistance, obesity, Alzheimer's disease, Parkinson's disease, cancer, inattentiveness, genital warts, and inflammation **Sources:** tea, supplemental form, capsules
- ▶ **Noni Berry** Noni Berry is a tropical fruit of the evergreen tree in the Pacific Islands, Southeast Asia, Australia, and India. It has been used as an herbal remedy. Scientific name Morinda citrifolia. Common names: noni, morinda, Indian mulberry, hog apple, canarywood. It contains high amounts of potassium. **Important for/potential beneficial properties:** • Antioxidant • Anti-inflammatory • Anti-allergy • Analgesic • Antibacterial • Antifungal • Antihypertensive • Gastrointestinal function • Anti-viral • Anti-lipemic • Anti-cancer • Immune Support • Neuroprotective **May be useful for the prevention/treatment of:** Pain, fatigue, cervical spondylosis, hypertension, hyperlipidemia, digestive issues, inflammatory skin conditions. **Sources:** Noni juice, juice concentrate, powder supplement, dried fruit powder, teas. It's often found in combination with grape juice.
- ▶ **Delta tocotrienol** Delta tocotrienol is a natural form of vitamin E. Vitamin E is a group of eight fat soluble compounds that include four tocopherols (alpha, beta, gamma and delta) and four tocotrienols (alpha, beta, gamma, and delta). Studies suggest that tocotrienols can provide health benefits distinct from alpha-tocopherol, the most well known form of vitamin E. Tocotrienols have greater fluidity which makes it easier for the body to incorporate them into cell membranes, especially delta-tocotrienol. **Important for/potential beneficial properties:** • Antioxidation • Antiaging • Anti-inflammatory • Anticancer • Brain health • Bone health • Cardiovascular effects • Prevention of platelet aggregation • Hypolipidemic effects • Neuroprotective effects **May be useful for the prevention/treatment of:** hyperlipidemia, certain types of cancer, atherosclerotic heart disease, metabolic syndrome. NAFLD, Parkinson's disease, osteopenia/osteoporosis **Sources:** palm oil, rice bran, annatto bean- the most potent source

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