

## CELLULAR MICRONUTRIENT ASSAY (CMA)

### VITAMINS

Biotin		<b>131% Insufficient</b>	Vitamin B2	
Delta tocotrienol			Vitamin B3	
MK4		<b>130% Insufficient</b>	Vitamin B6	
MK7			Vitamin B9	
Pantothenic acid			Vitamin C	
Vitamin A			Vitamin D	
Vitamin B1			Vitamin K1	
Vitamin B12		<b>118% Borderline</b>		

### MINERALS

Boron			Magnesium	
Calcium			Manganese	
Chromium			Molybdenum	
Copper		<b>124% Insufficient</b>	Selenium	
Iodine			Strontium	
Iron			Vanadium	
Lithium		<b>113% Borderline</b>	Zinc	

### AMINO ACIDS

Arginine			L-Tyrosine	
Asparagine			Lysine	
Cysteine		<b>&gt;140% Insufficient</b>	Methionine	
Glycine		<b>&gt;140% Insufficient</b>	Phenylalanine	
Histidine		<b>116% Borderline</b>	Taurine	
Isoleucine			Threonine	
Leucine			Tryptophan	
L-Glutamine			Valine	
L-Serine				

### OTHER NUTRIENTS

Carnitine		<b>&gt;140% Insufficient</b>	Lipoic Acid	
Choline			Omega 3 DHA	
Coenzyme Q10			Omega 3 EPA	
Glutathione		<b>&gt;140% Insufficient</b>	Omega 9	
Inositol		<b>124% Insufficient</b>		

	<b>100% - 109%</b>		Nutrient Sufficiency
	<b>110% - 119%</b>		Borderline Insufficiency
	<b>≥ 120%</b>		Insufficiency*

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### MICRONUTRIENTS TO ADDRESS

- ▶ **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.
- ▶ **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.
- ▶ **Cysteine**            L-cysteine is classified as a "semi-essential" amino acid manufactured from methionine. It is made in small amounts by the liver, but the availability of methionine is necessary **Important for:** • Protein synthesis • Support of the synthesis of glutathione, the body's "master antioxidant" • Immune support • Lipid metabolism • Digestive support • Vascular support • Antioxidation • Anti-inflammation • Nerve protection • Detoxification **May be useful for the prevention/treatment of:** Alzheimer's disease, Parkinson's disease, arthritis, poor intestinal health, dementia, multiple sclerosis, male infertility, and osteoporosis **Good food sources:** beef, pork, chicken, sunflower seeds, walnuts, and soy
- ▶ **Carnitine**            L-carnitine is a derivative of the amino acids, methionine and lysine, and is synthesized in the liver, kidneys, and brain. It plays a key role in energy production and is found in almost every cell of the body. Only L-carnitine is biologically active and is the form found in food. It is concentrated in skeletal and cardiac muscle tissues. **Important for:** • Mitochondrial function and energy production • Immune, brain, liver, and cardiac function • Elimination of toxic compounds • Blood lipid levels- reduction of triglycerides, increase in HDL **May be useful for the prevention/treatment of:** • certain cardiovascular issues and common diagnoses such as asthma, celiac disease, cirrhosis, IBD, diabetes, erectile dysfunction, NAFLD, fatigue, PCOS, COPD, and more. **Good food sources:** animal foods such as meat, fish, poultry, and dairy products (mostly in whey).
- ▶ **Glycine**              Although not considered "essential" because it is made from serine, glycine is considered a conditionally essential amino acid because there are many metabolic demands for it- including heme biosynthesis, collagen formation, and its role in digestion, detoxification and neurotransmitter action. **Important for:** • Collagen formation • Heme synthesis • Detoxification • Glutathione synthesis • Energy source/synthesis of glucose • Brain neurotransmitter effect/CNS function • Anti-cancer • Antioxidation **May be useful for the prevention/treatment of:** • Schizophrenia • Stroke • Seizures • Memory and cognitive performance in psychosis risk syndrome • Cystic fibrosis • Gout • Insomnia • Venous leg ulcers • Certain types of cancer **Good food sources:** gelatin, protein rich foods including meat, fish, dairy, and legumes
- ▶ **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

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## MICRONUTRIENTS TO ADDRESS

- ▶ **MK4** Vitamin K is a general name of a family of compounds with a common chemical structure-Vitamin K1 (phyloquinone or phytonadione), vitamin K2 (menaquinone), and vitamin K3 (menadione- no longer used in fortified foods/supplements). Vitamin K2 is a group of compounds which are classified according to their chemical structures- MK4 through MK13.. MK4, MK7, and MK9 are the most well studied menaquinones. Menaquinones, mostly originating from bacteria, are present in various animal based and fermented foods. Menaquinones are also produced by bacteria in the gut. MK4 is produced from vitamin K1 (phyloquinone). **Important for:** • Regulation of bone demineralization Directs calcium deposits to bones instead of soft tissue • Anti-inflammation • Anticoagulation • Antioxidation • Supports bone growth and development • Supports cardiovascular health • insulin sensitivity, energy utilization **May be useful for the prevention/treatment of:** beta-thalassemia, rheumatoid arthritis, cirrhosis, hepatitis, myelodysplasia, cardiovascular issues, osteoporosis, Alzheimer's disease, cognitive decline, wrinkles, diabetes, metabolic syndrome, arthritis, neurological issues, certain types of cancer, kidney disease, kidney stones, PCOS, anxiety, depression, postmenopausal bone loss, and cavities **Good food sources:** Dietary vitamin K2 is found in some fermented foods (ie, natto, cheese) where the specific menaquinone compound that is formed depends on the bacterial species and fermentation conditions. So not all fermented foods have the same menaquinone profile. An individual's dietary intake of vitamin K2 can vary greatly based on food selection and geography. MK4 is typically found in eggs, grass-fed meat, chicken, soft cheese, butter, liver (goose, chicken) chicken
- ▶ **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
- ▶ **Copper** Copper is an essential trace mineral found in all body tissues. **Important for:** • Red blood cell formation (along with iron), anemia prevention • Myocardial contractility • Maintenance of the health of blood vessels, nerves • Immune support, wound healing • Generation of energy from carbohydrate • Antioxidation (cofactor for SOD- superoxide dismutase) • Anti-inflammation support • Bone and tissue integrity • Cholesterol and glucose regulation **May be useful for the prevention/treatment of:** aortic aneurysm, burns, osteoporosis, peptic ulcer, RA, and disorders of taste **Good food sources:** Organ meats, seafood, nuts, especially cashews and walnuts, seeds, especially sesame and sunflower seeds, legumes, lentils, soybean, shiitake mushrooms, greens, asparagus, summer squash, wheat-bran cereals, and whole-grains and cocoa.
- ▶ **Vitamin B12** Vitamin B12 is a group of compounds called cobalamins. **Important for:** • DNA (genetic material) synthesis • Red blood cell formation • Nervous system and immune system function • Metabolism of homocysteine **May be useful for the prevention/treatment of:** issues of the skin, ears/nose/throat, issues associated with aging, and certain conditions/disorders of the cardiovascular, gastrointestinal, musculoskeletal, immune, and nervous systems **Good food sources:** Vitamin B12 is found almost exclusively in animal products- meat, poultry, fish, eggs, and dairy products. Beef liver and clams are the highest sources. B12 fortified breakfast cereals and nutritional yeasts.
- ▶ **Histidine** Histidine, an essential amino acid, is involved in a wide range of metabolic processes in the body, and is needed for growth and tissue repair. **Important for:** • Protection of nerve cells • Metabolism of the neurotransmitter, histamine • Immune, gastric, and sexual function • Manufacturing of red and white blood cells • Protection of tissues against radiation and heavy metals **May be useful for the prevention/treatment of:** rheumatoid arthritis, allergic diseases, ulcers, and anemia caused by kidney failure or kidney dialysis **Good food sources:** beef, lamb, pork, poultry, fish, cheese, nuts, seeds, eggs, legumes, soybeans, quinoa, and whole grains.

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## MICRONUTRIENTS TO ADDRESS

- ▶ **Vitamin B9** Vitamin B9, more commonly known as folate (naturally-occurring form of B9) or folic acid (a synthetic form), is a water-soluble vitamin that is part of the B vitamin family. **Important for:** • Growth and development • Homocysteine and vitamin B12 metabolism • Brain and CNS function • Immune system function • Cardiovascular support • Red blood cell production • Reproductive health **May be useful for the prevention/treatment of:** Alzheimer's disease, cardiovascular disease, homocysteine lowering, anemia, migraines, restless legs, dermatitis, autism, depression, cognitive decline/dementia, age-related macular degeneration, birth defects, diarrhea, hearing loss, osteoporosis, cervical dysplasia, ulcerative colitis, and recurrent miscarriages **Good food sources:** Spinach and other leafy greens, green vegetables, beets, banana, melon, legumes, yeast, mushrooms, oranges and tomato juice.
- ▶ **Lithium** Lithium is a trace mineral that is present in the diet, mainly in grains and vegetables. Some people use lithium supplements as medicine -lithium is available as an FDA approved prescription medication for use in psychiatric conditions. Supplements contain much smaller quantities than prescribed medication. **Important for:** • Modulation of the nervous system function • Modulation of neurotransmitter activity- GABA, serotonin, melatonin • Modulation of circadian rhythms • May be required for normal metabolism and neural communication **May be useful for the prevention/treatment of:** Bipolar disorder, depression, schizophrenia, impulsive aggressive behavior associated with ADHD. **Good food sources:** depending on geographical location due to uneven distribution of lithium in the earth's crust: cereals, potatoes, tomatoes, cabbage, and some mineral waters. It may also be found in some spices such as nutmeg, coriander seeds, or cumin. Small amounts also found in foods from animal origin like sardines and egg yolks. **IMPORTANT:** Lithium interacts with a number of herbs, supplements, medications, and medical conditions. Lithium supplementation should only be used with guidance and monitoring by a qualified practitioner.
- ▶ **Methionine** Methionine is an essential amino acid that is involved in the synthesis of important protein molecules and other amino acids. **Important for:** • The support of detoxification of toxins and heavy metals • Antioxidant function • Digestive support • The availability of folate • The support of healthy liver function • Reduction of histamine in blood • Exercise recovery, connective tissue production, and cardiovascular health • Hair and nail strength **May be useful for the prevention/treatment of:** pancreatitis, Parkinson's disease, urinary tract infections, and diaper rash **Good food sources:** Brazil nuts, meat, poultry, fish, yogurt, cheese, eggs, legumes, soybeans, sesame seeds, and grains

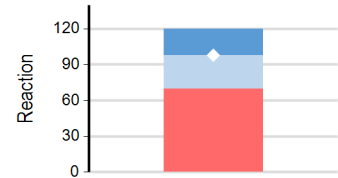
**IMPORTANT!** Identified adverse food reactions- allergies, sensitivities, and intolerances- should be avoided even if these cellular tests have shown those food sources of micronutrients/botanicals to be "beneficial." The CMA and APA test the responses of B and T lymphocytes, not antibodies (IgE-mediated allergies) or cells of the innate immune system (Alcat Test). Patients and practitioners are encouraged to carefully read all product/supplement labels and avoid all ingredients that are contraindicated for any reason.

## 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.

98

Above Average  
Normal Range  
Below Average



## ANTIOXIDANT PROTECTION ASSAY (APA)

### Antioxidants / Anti-inflammatories

Acai Berry		124% <b>Highly Protective</b>	Lycopene	
Andrographis		117% <b>Protective</b>	Maitake	
Astaxanthin			Mangosteen	
Astragalus		118% <b>Protective</b>	Melatonin	
Beta-Carotene			Milk Thistle	
Bilberry		120% <b>Highly Protective</b>	Moringa	
Boswellia		>140% <b>Highly Protective</b>	NADH	
Camu Camu			Noni Berry	
Catalase		122% <b>Highly Protective</b>	Piperine	
Chlorophyll			Pomegranate	
Cinnamon			Pycnogenol	
Coenzyme Q10			Pyroloquinoline	
Delta tocotrienol			Quercetin	
Echinacea			Resveratrol	
Elderberry		120% <b>Highly Protective</b>	Rhodiola	
Garlic		112% <b>Protective</b>	Selenium	
Ginger		111% <b>Protective</b>	Shiitake	
Ginkgo Biloba		120% <b>Highly Protective</b>	SOD	
Glutathione		>140% <b>Highly Protective</b>	Sulforaphane	
Goji Berry		116% <b>Protective</b>	Turmeric	
Grape Seed			Vitamin C	
Green Tea			Wild Cherry Bark	
Lavender		124% <b>Highly Protective</b>	Zeaxanthin	
Lipoic Acid		119% <b>Protective</b>	Zinc	
Lutein				

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

\*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

- ▶ **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/potential beneficial properties:** • 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 **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.
  
- ▶ **Pycnogenol**      Pycnogenol is an extract from the bark of a pine tree that grows along the coast of southwest France. **Important for/potential beneficial properties:** • Antioxidation • Anti-inflammatory • Anti-allergic • Anti-arthritis • Anti-asthmatic • Anti-cancer • Glucose regulation • Antimicrobial • Antiviral • Sun protection • Liver protection • Immune support • Energy Metabolism **May be useful for the prevention/treatment of:** allergic rhinitis, antiplatelet, asthma, chronic venous insufficiency, cognitive function, retinopathy, ADHD, cognitive decline, common cold, coronary artery disease, neuropathy, edema, erectile dysfunction, hyperlipidemia, Meniere's disease, menopausal symptoms, metabolic syndrome, obesity, psoriasis, SLE, and varicose veins **Sources:** Supplemental form or consumed as a "brew"
  
- ▶ **Boswellia**      Boswellia (Frankincense), is the hardened gum resin extruded from the trunk of the Boswellia carteri tree. **Important for/potential beneficial properties:** • Anti-inflammatory • Anti-bacterial • Antiviral • Anti-anxiety • Antiseptic, disinfectant • Immune enhancing • Memory enhancing • Hormone balancing • Digestive aid **May be useful for the prevention/treatment of:** pain and inflammation, asthma, acne, signs of aging, Crohn's disease, IBS, diabetes, cancer, osteoarthritis, depression, anxiety, leaky gut, gas, and constipation **Sources:** topically, aromatherapy
  
- ▶ **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
  
- ▶ **Acai Berry**      Acai berry is a palm tree widely distributed in the northern area of South America, particularly the Brazilian Amazon region. The fruit of acai is round, dark purple in color, and edible **Important for/potential beneficial properties:** • Anti-inflammatory • Antibacterial • Antioxidant • Anticancer • Blood glucose support • Cardiovascular support • Immune Support **May be useful for the prevention/treatment of:** hypercholesterolemia, metabolic syndrome/weight loss and obesity, diabetes, detoxification, aging skin, and for improving general health **Sources:** fruit can be consumed raw or as a juice. As supplement can be found in powders, tablets, and capsules
  
- ▶ **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

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### Beneficial Antioxidants

- ▶ **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.
  
- ▶ **Catalase** Catalase is a key antioxidant enzyme in the body's defense against oxidative stress. It converts free radicals into hydrogen peroxide which ultimately breaks down to stable and safe water and oxygen. **Important for/potential beneficial properties:** • Antioxidation • Anti-aging and anti-degenerative • Longevity support • Fat metabolism • Support of DNA integrity **May be useful for the prevention/treatment of:** degenerative disease, mitochondrial dysfunction, cardiac issues, and cataracts **Sources:** wheat and barley grass, alfalfa, Brussels sprouts, leeks, onions, broccoli, parsnips, zucchini, spinach, kale, radishes, carrots, red peppers, turnips, cucumbers, celery, avocado, potato, and red cabbage, kiwi, peaches, cherries, apricots, bananas, watermelon, pineapple
  
- ▶ **Elderberry** Elderberry is the dark purple berry of the European or Black elder, found in warmer areas of North America, Europe, Asia, and Northern Africa. A rich source of flavonoids, quercetin, rutin, phyosterols, carotenoids, and vitamins and minerals, the berries are cultivated for medicinal and food purposes. **Important for/potential beneficial properties:** • Antioxidant • Immunological support • Anti-inflammatory **May be useful for the prevention/treatment of:** shorten duration of common cold, influenza, and constipation **Sources:** Cooked elderberries are used as a flavoring in foods and wine. Elderberries are also in foods like jams and pies. Available in supplemental form as well
  
- ▶ **Bilberry** Bilberry, also known as European blueberry, is a dark purple fruit, native to northern Europe, the northern US, and Canada. Bilberry's applicable parts, the berries and the leaves, have been used for medicinal purposes since the Middle Ages. The berries contain tannins and several anthocyanidins and the leaves contain polyphenols such as resveratrol, and flavonoids such as quercetin. **Important for/potential beneficial properties:** Antibacterial, Anticancer, Anti-inflammation, Antioxidation, Antiplatelet, Digestive support/Antiulcer, Antimicrobial, Hepatoprotective/renal protective, Blood glucose support, Hypotensive, vasoprotective, Immune support, Lipemic support, Neuroprotective, brain support, Vision support **May be useful for the prevention/treatment of:** Diabetes, prediabetes, obesity, metabolic syndrome, Hyperlipidemia, hypertension, CVD, vascular permeability, Oxidative stress/damage, Ulcerative colitis, Cancer, Dementia, Age related disease, Ocular disorders, night vision **Sources:** Fresh or dried bilberries, supplementation
  
- ▶ **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

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### Beneficial Antioxidants

- ▶ **Lipoic Acid** Lipoic Acid is synthesized by humans and is present in a wide range of foods. **Important for/potential beneficial properties:** • Antioxidation • Anti-inflammatory • Regeneration of other antioxidants- vitamin E, vitamin C, and glutathione • Endocrine support, glucose regulation • Anti-obesity • Antiviral • Cardiovascular support • Vascular support • Neurological support • Bone support **May be useful for the prevention/treatment of:** aging skin associated with sun damage, cognitive decline, diabetes, insulin resistance, erectile dysfunction, glaucoma, NASH, peripheral neuropathy, burning mouth syndrome, obesity, hepatitis, migraines, myopathy, taste disorders, vitiligo, and wound healing **Sources:** red meat, organ meats, spinach, broccoli, potatoes, yams, carrots, beets, and yeast
  
- ▶ **Moringa** Moringa is a plant native to India, Pakistan, and other countries. Applicable parts include leaves, bark, flowers, fruit, seeds, and roots. **Important for/potential beneficial properties:** Analgesic, Anti-arsenic, Anti-inflammatory, Anti-oxidation, Antiasthmatic, Antibacterial, antifungal, Blood glucose support, Antifertility\*, Anticancer, Antiplatelet, Anti-viral, Cardiovascular/blood pressure support, Galactagogue, Gastrointestinal support, Immune support, Lipid support, Wound healing **May be useful for the prevention/treatment of:** Asthma, Diabetes, Hyperlipidemia **Sources:** oil, dried leaves as powder/capsules, fresh leaves can be used in salads, added to shakes, casseroles  
NOTE: Oral intake of moringa root and root bark may be unsafe. More evaluation necessary \*Moringa is reported to have estrogenic/antiestrogenic and contraceptive activity. Moringa root and bark can prevent implantation and leaf extract can result in abortion. May further reduce thyroid hormone levels in those with hypothyroidism.
  
- ▶ **Astragalus** Astragalus comes from the root of a perennial plant in the legume family that grows in the northern and eastern parts of China as well as in Mongolia and Korea. There are more than 2,000 species of astragalus but most astragalus supplements contain Astragalus membranaceus. Astragalus contains a variety of active constituents including more than 40 saponins, several flavonoids, polysaccharides, trace minerals, amino acids, and coumarins. – Astragalus is also called huang qi or milk vetch. **Important for/potential beneficial properties:** • Antibacterial • Anti-inflammatory • Antioxidant • Antiviral • Bone support • Cardiovascular support • Fertility –increase in sperm motility • Blood glucose support • Liver and kidney protective • Immune support • Vasorelaxant • Wound healing **May be useful for the prevention/treatment of:** common cold, upper respiratory infections, fibromyalgia, diabetes, blood pressure, heart disease, weakness, arthritis, hepatitis, breast and lung cancer, asthma, and anxiety **Sources:** The root of the astragalus plant is put in soups, teas, extracts, and capsules.
  
- ▶ **Andrographis** Andrographis is a plant that is native to South Asian countries such as India and Sri Lanka. Known as the “King of bitters”, it is commonly used in Ayurvedic medicine. **Important for/potential beneficial properties:** • Analgesic • Antibacterial • Anti-viral • Anti-inflammatory • Antiplatelet • Anticancer • GI, cardiovascular, liver support • Blood glucose regulation • Immunomodulatory **May be useful for the prevention/treatment of:** common cold, influenza, tonsillitis, IBD- ulcerative colitis, and RA **Sources:** supplementation
  
- ▶ **Goji Berry** Goji berry, also known as wolfberry, is a nutrient rich bright orange-red berry that comes from a shrub native to China and distributed in Asia, the Mediterranean, North America, and Australia. The root bark and sweet, red fruits of goji are used in traditional Chinese medicine. **Important for/potential beneficial properties:** • Anticancer • Blood glucose support • Antifatigue • Antimicrobial • Antioxidant • Cardiovascular support • Hepatoprotective • Immune support **May be useful for the prevention/treatment of:** • Diabetes • Dry eye • Athletic performance • Sleep quality • Fatigue • Mood support • Overweight • Glaucoma • Fertility • Hyperlipidemia **Sources:** Goji berries can be eaten raw, cooked, or dried. Often found in herbal teas and wines.
  
- ▶ **Maitake** This edible and medicinal mushroom, is a perennial fungus that grows in clusters at the base of trees. The active constituents of maitake include beta-glucans, agarico glycerides, and fiber. **Important for/potential beneficial properties:** • Tumor inhibition • Immune system support • Anti-inflammatory • Antiviral • Blood glucose regulation • Cardiovascular support • Hormonal support • Blood lipid reduction **May be useful for the prevention/treatment of:** diabetes, PCOS, certain types of cancer, hypertension, and hepatitis B **Sources:** Maitake is available fresh and in powders, capsules, and extracts

These laboratory results are not intended to diagnose a disease state. The performance characteristics of all assays have been verified by Cell Science Systems, Corp. All information provided is only a suggested guideline and should not be substituted for professional medical advice, diagnosis, or treatment.

The descriptions that follow are for educational purposes only. Statements are not to be interpreted as treatment recommendations and do not take the place of advice from a qualified practitioner. Please be aware that botanicals and high doses of certain nutrients may interact with medications, botanicals, and medical diagnoses, and therefore may be contraindicated. The patient is encouraged to seek guidance and an individualized food and supplement plan from a qualified nutrition practitioner.

### Beneficial Antioxidants

- ▶ **Garlic** One of the most popular herbs in the US, garlic and its sulfur containing compounds, provide a variety of health advantages and culinary uses. Some of its health benefits have been linked to the compound, allicin. **Important for/potential beneficial properties:** Antibacterial, Antifungal, Anti-inflammation, Antioxidation, Antiviral, Antiparasitic, Anti-platelet, Detoxification support, Cardiovascular support, Lipid lowering, Blood glucose support, Chemoprotection/anticancer, Dermatologic and bone support, GI protection, Immune enhancing, Vasorelaxation, Hepatoprotective **May be useful for the prevention/treatment of:** Cardiovascular disease- myocardial infarction, coronary artery disease, hypertension, atherosclerosis, blood clotting, GI cancers- mouth, pharyngeal, esophageal, stomach, Bacterial infections such as H. pylori, Candida albicans infections, Osteoporosis, Type 2 diabetes, Inflammation related to arthritis **Sources:** whole fresh garlic-crushed, chopped, garlic powder, garlic oil, garlic extract, supplementation. Many products are standardized to allicin content.
- ▶ **Ginger** Ginger is a flowering plant native to parts of Asia and cultivated in South America, Africa, and the Middle East. It is used worldwide for culinary and medicinal purposes. **Important for/potential beneficial properties:** Antinausea and vomiting, Arthritis pain relief, Dysmenorrhea pain relief, Gastrointestinal support, Respiratory support, Anti-inflammation, Antibacterial, anti-fungal, Anti-platelet, Blood glucose support, blood lipid support, Anti-oxidation, Blood pressure support, Immune support **May be useful for the prevention/treatment of:** Motion sickness, Nausea and vomiting of pregnancy, Nausea and vomiting-chemotherapy-induced, post-anesthesia, Rheumatoid arthritis, osteoarthritis, Dysmenorrhea, Hyperlipidemia, Diabetes, Hypothyroidism, Irritable bowel syndrome, Migraine pain **Sources:** Fresh, dried Tea Supplementation
- ▶ **Melatonin** Melatonin is a hormone produced from tryptophan in the brain by the pineal gland and the gastrointestinal tract. It regulates the body's circadian rhythm, endocrine secretions, and sleep patterns. **Important for/potential beneficial properties:** Analgesic, Antiaging, Antiarthritis, Anticancer, Anticonvulsant (controversial), Anti-inflammatory, Antioxidant, Antiparasitic, Antiviral, Blood glucose support, Bone support, Blood pressure support, Gastrointestinal protection, Hormonal support, Immune support, Hypolipidemic, Hepatoprotective, Neuroprotective, Weight loss effects **May be useful for the prevention/treatment of:** Age- related macular degeneration, Anesthesia premedication, Cancer, Eczema, Endometriosis, Headache disorders, Insomnia, IBS, Non-ulcer dyspepsia, Sarcoidosis, Schizophrenia, Seasonal affective disorder, Tardive dyskinesia, Thrombocytopenia, Tinnitus **Sources:** Supplementation  
NOTE: Because of the potential for daytime sleepiness, driving or operating machinery should be avoided 4-5 hours after taking melatonin.

**IMPORTANT!** Identified adverse food reactions- allergies, sensitivities, and intolerances- should be avoided even if these cellular tests have shown those food sources of micronutrients/botanicals to be "beneficial." The CMA and APA test the responses of B and T lymphocytes, not antibodies (IgE-mediated allergies) or cells of the innate immune system (Alcat Test). Patients and practitioners are encouraged to carefully read all product/supplement labels and avoid all ingredients that are contraindicated for any reason.