CELL SCIENCE SYSTEMS

Lab Director
Dr.Jennifer Spiegel, M.D.

CELLULAR NUTRITION ASSAYS

Patient Information: PATIENT II, PRETEND

Date of Birth:	11/04/1977	Gender:	F	**Lab ID:**	**68220**
Date Received:	02/11/2010	Date Collected:	01/01/2010	Date Reported:	05/21/2020
Physician:	Sample Physician			Clinic ID:	10804

CMA (CELLULAR MICRONUTRIENT ASSAY)

Nutrient Sufficiency | Borderline Nutrient Insufficiency | Nutrient Insufficiency

Vitamins

Biotin	<140%	Insufficient
Delta tocotrienol	103%	
MK4		No Proliferation
MK7		No Proliferation
Pantothenic acid		No Proliferation
Vitamin A	105%	
Vitamin B1		No Proliferation
Vitamin B12		No Proliferation
Vitamin B2	124%	Insufficient
Vitamin B3	104%	
Vitamin B6	<140%	Insufficient
Vitamin B9	118%	Borderline
Vitamin C	<140%	Insufficient
Vitamin D	116%	Borderline
Vitamin K1	124%	Insufficient

Minerals

Boron		No Proliferation
Calcium		No Proliferation
Chromium	107%	
Copper	104%	
Iodine	108%	
Iron	131%	Insufficient
Lithium		No Proliferation
Magnesium	104%	
Manganese		No Proliferation
Molybdenum	101%	
Potassium		No Proliferation
Selenium	112%	Borderline
Strontium	106%	
Vanadium	104%	
Zinc		No Proliferation

Amino Acids

Arginine	111%	Borderline
Asparagine	101%	
Cysteine	132%	Insufficient
Glycine	106%	
Histidine		No Proliferation
Isoleucine	108%	
Leucine		No Proliferation
L-Glutamine		No Proliferation
L-Serine	104%	
L-Tyrosine	<140%	Insufficient
Lysine		No Proliferation
Methionine	113%	Borderline
Phenylalanine		No Proliferation
Taurine		No Proliferation
Threonine	105%	
Tryptophan	105%	
Valine	101%	

Other Nutrients

Alpha-Ketoglutarate	108%	
Carnitine		No Proliferation
Choline		No Proliferation
Glutathione	104%	
Inositol		No Proliferation

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Significant Micronutrients

- **L-Tyrosine**

Tyrosine is a non-essential amino acid that is synthesized in the body from an essential amino acid, phenylalanine. **Important for:** • Building block for protein synthesis • Synthesis of the brain chemicals, dopamine, norepinephrine, and epinephrine • Regulation of mood, appetite, pain sensitivity • Thyroid, adrenal, and pituitary function **May be useful for the prevention/treatment of:** depression, ADHD, cognitive performance and memory, narcolepsy, acute stress, alcohol, heroine, and cocaine withdrawal **Good food sources:** poultry, fish, avocados, almonds, cheese, milk, yogurt, bananas, soybean, legumes, nuts, seeds, and some grains

- **Vitamin B6**

Pyridoxine helps convert food into fuel and is a cofactor for more than 50 different enzymes. **Important for:** • Metabolism of fats and proteins • Nerve function • Steroid hormone function • Arterial integrity • Immune function • Synthesis of niacin from tryptophan • Breakdown of homocysteine **May be useful for the prevention/treatment of:** atherosclerosis, hair loss, acne, Meniere's disease, taste disorders, vertigo, neurological conditions, gestational diabetes, premenstrual syndrome, anxiety, ADHD cognitive decline, depression, and possibly some protection from certain toxin induced issues **Good food sources:** Poultry, fish, organ meats, potatoes, banana, seeds, soybeans, spinach, whole grains, 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

- **Vitamin C**

Vitamin C (ascorbic acid) is a water soluble vitamin that is essential for human survival. **Important for:** • Antioxidation • Anti-inflammation • Immune function • Blood vessel formation • Muscle formation • Collagen production • Brain Health/neurotransmitter production • Absorption of iron • Blood lipid regulation • Detoxification **May be useful for the prevention/treatment of:** allergic rhinitis,asthma, cardiovascular issues, certain types of cancer, cold and flu, GI issues- constipation, gallstones, gastritis, UTIs, muscle cramps, dysfunctional uterine bleeding, glaucoma, depression, diabetes, obesity, post exercise muscle soreness, and sinusitis **Good food sources:** citrus fruits, raspberries, strawberries pineapple, kiwi, cantaloupe, greens, cruciferous vegetables- Brussels sprouts, broccoli, squash, green beans, carrots, potatoes, tomatoes, peppers

- **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

- **Iron**

Iron is a mineral found in trace amounts in every cell in the body. Most of the iron in the body is found in the hemoglobin of red blood cells that carries oxygen from the lungs to the tissues of the body and in myoglobin, a protein providing oxygen to muscles. It also functions in several key enzymes in energy production and metabolism, including DNA synthesis. **Important for:** • Oxygen transport • Growth and development • Immune activity • Energy production and metabolism • Hormone, neurotransmitter, and DNA synthesis **May be useful for the prevention/treatment of:** ADHD, cognitive decline/dementia, fatigue, infertility, and restless leg syndrome. **Good food sources:** Iron exists in foods in two forms, heme iron and nonheme iron. The richest sources of heme iron are oysters, liver, lean red beef, poultry, tuna, and salmon. Non-heme iron is harder for the body to absorb. Sources of non-heme iron are legumes, whole grains, nuts, dried fruit, and greens. Consuming these foods with vitamin C rich foods and/or heme sources of iron, enhances the absorption of nonheme iron.

- **Vitamin B2**

Vitamin B2, or riboflavin, is an essential vitamin involved in vital metabolic processes. It is a component of two major coenzymes flavin mononucleotide (FMN-aka riboflavin-5-phosphate) and flavin adenine dinucleotide (FAD). **Important for:** • Normal cell function, growth and development • Metabolism of carbohydrate, protein, and fat for energy production. • Cofactor needed to produce glutathione, a very important antioxidant • Homocysteine metabolism • Promotes iron metabolism • Metabolism of steroids and certain drugs **May be useful for the prevention/treatment of:** migraines, Parkinson's disease, hyperhomocysteinemia, and psoriasis **Good food sources:** turkey, sardines, eggs, legumes, soybeans, broccoli, cauliflower, Brussels sprouts, peppers, root vegetables, and squash

- **Vitamin K1**

Vitamin K is a general name of a family of compounds with a common chemical structure-Vitamin K1 (phylloquinone or phytonadione), 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.

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Significant Micronutrients

- **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.

- **Vitamin D**

  Vitamin D, known as the "sunshine" vitamin, is a fat soluble vitamin produced by the body in response to sun exposure; it is naturally present in few foods. It functions as a prohormone. **Important for:** • Calcium absorption in the gut • Bone development, bone mineralization, bone health • Regulation of serum calcium and phosphorous levels • Neuromuscular and immune function and maturation of white blood cells • Cell growth • Enhancement of insulin secretion/action • Reduction of inflammation **May be useful for the prevention/treatment of:** eczema, colds, hepatitis C, osteomalacia/osteoporosis, asthma, burns, cancer, CHF, Crohn's disease, depression, diabetes ,fatigue, Parkinson's disease, PCOS, lupus, and more **Good food sources:** oily fish -salmon, sardines, herring, mackerel, and tuna, cod liver oil , fortified milk, eggs, liver

- **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

- **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

- **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.

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.

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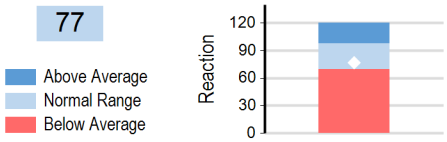
REDOX / APA (ANTIOXIDANT PROTECTION ASSAY)

The Redox score indicates an average response.

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.



No Significant Response | Protective | Highly Protective

Antioxidants / Anti-inflammatories

Acai Berry		No Proliferation	Milk Thistle		No Proliferation
Andrographis	120%	Highly Protective	NADH		No Proliferation
Astaxanthin	101%		Noni Berry		No Proliferation
Astragalus	114%	Protective	Omega 3 DHA		No Proliferation
Beta-Carotene	122%	Highly Protective	Omega 3 EPA		No Proliferation
Camu Camu		No Proliferation	Omega 6	106%	
Catalase	112%	Protective	Omega 7		No Proliferation
Chlorophyll	123%	Highly Protective	Omega 9		No Proliferation
Coenzyme Q10		No Proliferation	Piperine		No Proliferation
Delta tocotrienol	103%		Pomegranate		No Proliferation
Echinacea	119%	Protective	Pycnogenol		No Proliferation
Elderberry	106%		Pyrroloquinoline	108%	
Frankincense		No Proliferation	Quercetin	117%	Protective
Ginkgo Biloba	101%		Resveratrol	118%	Protective
Glutathione	124%	Highly Protective	Rhodiola	101%	
Goji Berry		No Proliferation	Selenium		No Proliferation
Grape Seed	101%		Shiitake	116%	Protective
Green Tea	125%	Highly Protective	SOD	107%	
Lavender	103%		Sulforaphane	107%	
Lipoic Acid	106%		Turmeric	120%	Highly Protective
Lutein	123%	Highly Protective	Vitamin C	103%	
Lycopene		No Proliferation	Wild Cherry Bark		No Proliferation
Maitake	106%		Zeaxanthin	109%	
Mangosteen	110%	Protective	Zinc	111%	Protective

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APA (ANTIOXIDANT PROTECTION ASSAY)

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Beneficial Antioxidants / Anti-inflammatories

- **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

- **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.

- **Chlorophyll**

  Chlorophyll is a pigment that gives plants their green color. **Important for/potential beneficial properties:** • Anti-aging • Anti-cancer • Antiviral • Deodorant • Wound healing **May be useful for the prevention/treatment of:** acne, herpes simplex virus and shingles, lung and other types of cancer, pancreatitis, skin cancer, fatigue, arthritis, and fibromyalgia **Sources:** greens, chlorella, spirulina, alfalfa, parsley, broccoli, green cabbage, asparagus, green beans and peas, matcha green tea, wheat grass, algae and supplemental form.

- **Lutein**

  Lutein is a carotenoid vitamin, lutein is related to beta-carotene and is one of two major carotenoids (and zeaxanthin) found as a color pigment in the human eye. **Important for/potential beneficial properties:** • Antioxidation • light filter • Ocular protection **May be useful for the prevention/treatment of:** AMD, cataracts, cognitive decline, certain types of cancer, CVD, and diabetes **Sources:** kale, spinach, broccoli, corn, kiwi, grapes, orange juice, squash, egg yolk, pistachios

- **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

- **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

- **Turmeric**

  Turmeric, a plant related to ginger, has been used in Ayurvedic medicine for many conditions including breathing problems, pain, and fatigue. It is a common spice and a major ingredient in curry powder. **Important for/potential beneficial properties:** • Anti-inflammatory • Antioxidation • Antibacterial • Antiseptic • Interference with cancer cell signaling • Blood glucose regulation • Fat metabolism • Wound healing **May be useful for the prevention/treatment of:** arthritis, joint pain, diabetes, digestive conditions- IBS, IBD, obesity, age-related cognitive decline, depression, high triglyceride blood levels, rheumatoid arthritis, and certain types of cancer **Sources:** Turmeric is a common spice and a major ingredient in curry powder. Turmeric's underground stems are dried and made into capsules, tablets, teas, powders, and extracts. Turmeric powder can also be made into a paste for skin issues.

- **Echinacea**

  Echinacea is a perennial wildflower native to North America and is closely related to sunflowers, daisies, and ragweed. **Important for/potential beneficial properties:** • Antibacterial • Antifungal • Anti-inflammatory • Antioxidant • Anti-vital • Immune stimulating • Wound healing **May be useful for the prevention/treatment of:** infections, common cold, herpes simplex infection (topical), psoriasis(topical), gum inflammation, upper respiratory tract infections (viral), tonsillitis, urinary tract infections, vaginal yeast infection, skin wounds/ulcers (topical), and leukopenia from chemotherapy. **Sources:** Echinacea is often sold as an herbal supplement.

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Beneficial Antioxidants / Anti-inflammatories

- **Resveratrol** — Resveratrol is a naturally occurring polyphenol produced by plants to protect from threats to plants' survival- fungus, drought, inflammation, UV irradiation. **Important for/potential beneficial properties:** • Antioxidation • Anti-aging • Anti-cancer • Anti-inflammatory • Anti-coagulant • Antiviral • Cardioprotective • Liver protection • Immune support • Neuroprotective • Pulmonary protection • Fat metabolism **May be useful for the prevention/treatment of:** Alzheimer's, cardiovascular disease, metabolic syndrome/obesity, diabetes, insulin resistance, cognitive decline, allergic rhinitis, certain types of cancer, and ulcerative colitis **Sources:** red wine, red grape skins, purple grape juice, mulberries, peanuts, mulberries, blueberries and bilberries, eucalyptus, and spruce

- **Quercetin** — Quercetin is an antioxidant that belongs to a class of water-soluble plant substances called flavonoids, which are present in certain fruits and vegetables **Important for/potential beneficial properties:** • Antioxidation • Inhibition of histamine release, anti-allergy • Enhancement of capillary and tissue integrity • Certain cancer risk reduction • Anti-inflammatory • Antiviral • Immune support • Glucose regulation • Inhibition of AGE formation **May be useful for the prevention/treatment of:** obesity, CVD, allergic rhinitis, Meniere's disease, diabetes, interstitial cystitis, prostatitis **Sources:** capers, onions, elderberries, kale, okra, radicchio, watercress, carob fiber, dill weed, radish leaves, apple peel, asparagus, goji berries

- **Shiitake** — Shiitake mushrooms are edible mushrooms native to East Asia. Research on the compounds in shiitake mushrooms, shows that this fungus provides many health benefits. **Important for/potential beneficial properties:** • Anti-inflammatory • Antioxidant • Cardiovascular support • Lipid lowering • Immune system support • Blood glucose regulation • Tumor inhibition **May be useful for the prevention/treatment of:** Type 2 diabetes, cardiovascular disease, certain types of cancers, immune issues, and hypertension **Sources:** You can find it fresh, dried or in various dietary supplements.

- **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.

- **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

- **Zinc** — Zinc is an essential mineral involved in numerous aspects of cellular metabolism. It is a major component of over 300 metabolic enzymes. **Important for/potential beneficial properties:** • Immune function and wound healing • Protein and DNA synthesis • Growth and development • Proper sense of taste and smell, visual function, hearing • Antioxidation and anti-inflammation • Protection of cell membranes Production of stomach acid **May be useful for the prevention/treatment of:** acne, brittle nails, warts, hearing, olfactory and taste disorders, colds, gastroenteritis, age-related macular degeneration, anorexia nervosa, ADHD, depression, RA, psoriatic arthritis, BPH, body odor, cirrhosis, cancer, and more. **Sources:** Oysters, meat, poultry, seafood, legumes, nuts, seeds, peanuts, egg yolks, whole grains, wheat bran, wheat germ, fruit, and dairy products.

- **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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