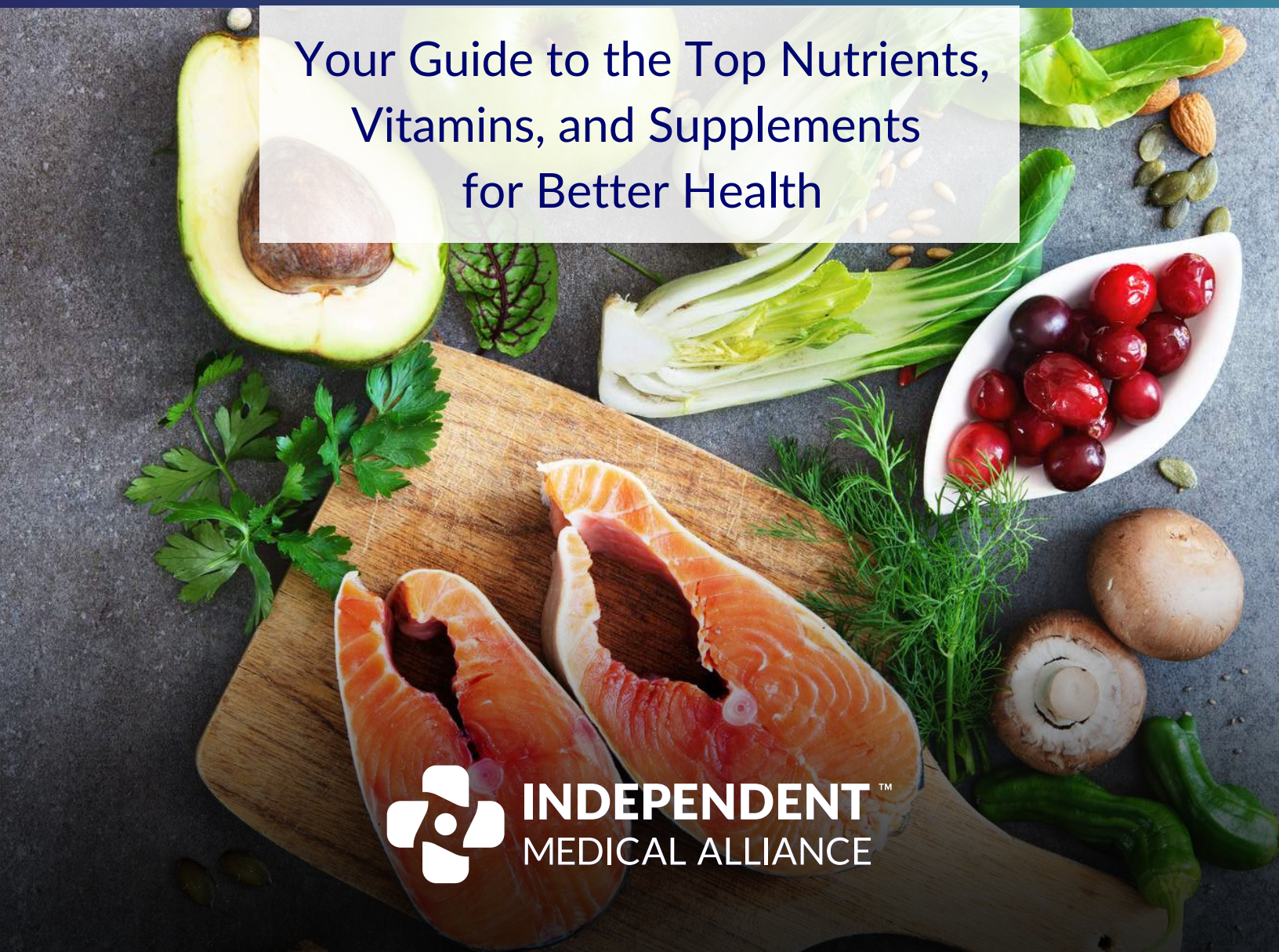




FROM A TO ZINC

Your Guide to the Top Nutrients,
Vitamins, and Supplements
for Better Health

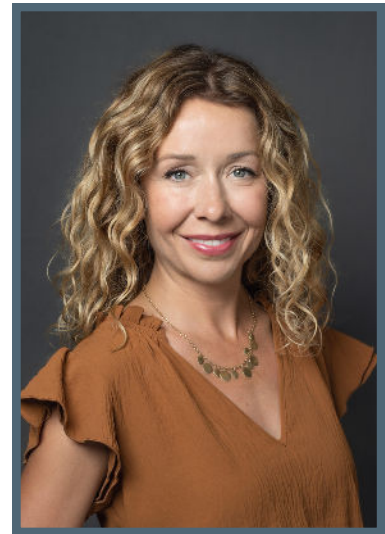


INDEPENDENT[™]
MEDICAL ALLIANCE

ABOUT THIS GUIDE

This guide was created to educate and empower you to take ownership of your health from the inside out. It goes beyond basic nutrition to explore the full spectrum of vitamins, minerals, amino acids, antioxidants, and specialty compounds that your body needs to truly thrive—not just survive. For each nutrient, you will find a clear overview of what it does, what deficiency looks like in the body, the best food and supplemental sources, and optimal dosage ranges used in functional and integrative practice rather than the conservative RDA (Recommended Dietary Allowance)—a standard designed to prevent deficiency, not to optimize health.

This guide was written by IMA Senior Fellow, Nutritional and Holistic Health Dr. Kristina Carman—registered nutritional therapist, naturopathic doctor, functional medicine practitioner, and health coach. Kristina's work is rooted in a simple but profound belief: that food, nutrition, and lifestyle are among the most powerful forms of medicine available to us. Her practice is built as a true wellness hub, a place where guidance is friendly and accessible to anyone ready to take their health seriously. She brings a whole-person approach to every patient she works with, leaving no stone unturned in the pursuit of lasting, natural health.



Dr. Kristina Carman
IMA Senior Fellow,
Nutritional & Holistic Health

Please note: This guide is for educational purposes only and is not a substitute for personalized medical advice. Always consult a qualified healthcare professional before starting new supplements, especially if you are pregnant, breastfeeding, taking medication, or managing a medical condition. For contraindications, please refer to the end of this guide.

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MINERALS: Magnesium, Iron, Selenium, Zinc, Boron, Calcium, Chromium, Copper, Iodine, Lithium (low-dose), Potassium, Silica, Vanadium, Molybdenum



AMINO ACIDS: Glycine, L-Arginine & L-Citrulline, L-Glutamine, L-Lysine, NAC (N-Acetyl Cysteine), Taurine, L-Carnitine, L-Tyrosine, L-Tryptophan, GABA (gamma-aminobutyric acid), 5-HTP (5-Hydroxytryptophan), L-Proline, L-Methionine, Inositol, BCAAs (branched chain amino acids), L-Theanine



ANTIOXIDANTS & PLANT COMPOUNDS: Alpha Lipoic Acid (ALA), Astaxanthin, Berberine, Coenzyme Q10 (CoQ10), Curcumin/Turmeric, Honeysuckle, Dandelion, Elderberry, Milk Thistle (Silymarin), Nigella Sativa (Black Seed Oil), Quercetin, Omega-3, Pine Bark Extract (Pycnogenol), Resveratrol, Glutathione, Spirulina & Chlorella



GUT & METABOLIC: Butyrate, Collagen/Collagen Peptides, Digestive Enzymes, Fiber/Prebiotic, Probiotics, Specific Probiotics



HORMONAL & SPECIALTY: DHEA (Dehydroepiandrosterone), Melatonin, S-adenosyl-methionine (SAMe), St. John's Wort (*Hypericum perforatum*), Saffron (*Crocus sativus*), Phosphatidylserine, Pregnenolone, Spermidine



VITAMINS





VITAMIN A

Vitamin A is a group of fat-soluble compounds including retinol, retinal, and retinyl esters, as well as provitamin A carotenoids such as beta-carotene found in plant foods. It is one of the most essential nutrients for immune function, vision, skin health, and cellular communication. Vitamin A plays a critical role in gene expression, influencing the development and function of virtually every organ system in the body. It exists in two primary dietary forms: preformed vitamin A from animal sources and provitamin A carotenoids from plant sources, which must be converted by the body—a process that is highly inefficient in many people.

How it helps:

- Supports healthy vision — particularly night vision and low-light adaptation
- Essential for immune system development and function
- Promotes healthy skin and mucous membrane integrity
- Supports healthy reproductive system in both men and women
- Essential for fetal development during pregnancy
- Supports bone health and growth
- Promotes healthy gene expression and cellular differentiation
- Powerful antioxidant via carotenoid forms
- Supports healthy thyroid function
- Supports lung and respiratory health

Signs of deficiency:

- Night blindness and poor low-light vision
- Dry eyes and Bitot's spots
- Dry, rough, or acne-prone skin
- Frequent infections and weakened immunity
- Hair loss and poor hair health
- Infertility and reproductive issues
- Poor wound healing
- Respiratory infections
- Growth delays in children

Vitamin A-rich foods:

- Beef liver (richest source by far)
- Cod liver oil
- Salmon and fatty fish
- Eggs
- Dairy products
- Sweet potato (beta-carotene)
- Carrots (beta-carotene)
- Leafy greens (beta-carotene)
- Red bell peppers (beta-carotene)
- Mango and cantaloupe (beta-carotene)

Optimal Dosages:

- General health maintenance: 3,000–5,000 IU daily of preformed vitamin A (retinol)
- Immune and skin support: 5,000–10,000 IU daily
- Therapeutic support: up to 25,000 IU daily — short term only and under practitioner supervision
- Always choose preformed vitamin A (retinol) from animal sources or cod liver oil for reliable activity — beta-carotene conversion is highly variable and unreliable, particularly in those with thyroid issues, diabetes, or specific gene variants
- Vitamin A is fat soluble — take with a fat-containing meal
- Works synergistically with vitamins D and K2 — these fat-soluble vitamins should ideally be taken together
- Toxicity is possible at sustained high doses — do not exceed 10,000 IU daily long term without testing
- Pregnant women should not exceed 10,000 IU daily — excess preformed vitamin A is teratogenic at very high doses
- Those with liver conditions should use caution and consult a practitioner



VITAMIN B1 (THIAMINE)

Thiamine is a water-soluble B vitamin essential for converting carbohydrates into energy. It plays a critical role in nerve function and is required by virtually every cell in the body. Because the body cannot store it well, consistent dietary intake is essential.

How it helps:

- Converts food into usable energy
- Supports healthy nerve function
- Promotes healthy brain function
- Supports cardiovascular health
- Essential for muscle function

Thiamine-rich Foods:

- Whole grains
- Pork
- Legumes (black beans, lentils)
- Sunflower seeds
- Trout
- Mussels
- Nutritional yeast
- Asparagus
- Brussels sprouts

Signs of deficiency:

- Fatigue and weakness
- Nerve damage (tingling/numbness)
- Memory problems and confusion
- Irritability
- Poor appetite
- In severe cases: Beriberi or Wernicke's encephalopathy

Optimal Dosages:

- General health: 50–100 mg daily
- Neurological support: 100–300 mg daily
- Best taken as benfotiamine (fat-soluble form) for superior absorption, especially for nerve and metabolic support
- Take with food; works best alongside the full B vitamin family



VITAMIN B2 (RIBOFLAVIN)

Riboflavin is a water-soluble vitamin that acts as a precursor to two major coenzymes—FAD and FMN—which are critical for energy metabolism, cellular function, and the metabolism of fats, drugs, and steroids. It also plays a key role in converting other B vitamins into their active forms.

How it helps:

- Supports cellular energy production
- Activates B6, folate, and B12
- Powerful antioxidant properties
- Supports healthy skin and eyes
- Promotes growth and development
- May reduce frequency of migraines

Riboflavin-rich foods:

- Beef liver
- Beef
- Clams
- Salmon
- Milk and dairy products
- Eggs
- Almonds
- Mushrooms
- Spinach
- Fortified cereals

Signs of deficiency:

- Cracked lips and mouth sores
- Sore or swollen throat
- Skin rashes
- Hair loss
- Fatigue
- Sensitivity to light
- Bloodshot or itchy eyes

Optimal Dosages:

- General health: 25–50 mg daily
- Migraine prevention: 400 mg daily (well-supported in clinical literature)
- Look for riboflavin-5-phosphate (active form) for better bioavailability
- Note: may cause bright yellow urine — this is harmless



VITAMIN B3 (NIACIN)

Niacin exists in two primary forms—nicotinic acid and niacinamide—and is essential for over 400 enzymatic reactions in the body. It is a key player in energy metabolism, DNA repair, and cell signaling. Niacin also has well-established cardiovascular benefits, particularly in supporting healthy cholesterol levels.

How it helps:

- Supports energy metabolism
- Promotes healthy cholesterol levels
- Supports DNA repair and cell signaling
- Improves skin health
- Supports brain function and mental clarity
- May reduce inflammation

Niacin-rich foods:

- Beef liver
- Chicken breast
- Tuna and salmon
- Turkey
- Pork
- Peanuts
- Avocado
- Brown rice
- Mushrooms
- Fortified cereals

Signs of deficiency:

- Pellagra (dermatitis, diarrhea, dementia)
- Fatigue and weakness
- Depression and anxiety
- Headaches
- Memory loss
- Skin rashes especially in sun-exposed areas
- Digestive issues

Optimal Dosages:

- General health: 25–50 mg daily as niacinamide (no flush)
- Cholesterol support: 500–2,000 mg daily as nicotinic acid (causes flushing – start low)
- NAD+ support/longevity: consider NMN or NR as alternative niacin precursors
- High doses should be taken under practitioner guidance due to liver considerations



VITAMIN B5 (PANTOTHENIC ACID)

Pantothenic acid is found in nearly every food, yet deficiency is more common than expected due to food processing. It is essential for synthesizing coenzyme A (CoA), which is central to energy metabolism and the production of hormones, red blood cells, and neurotransmitters. Its name comes from the Greek word "pantothén," meaning "from everywhere."

How it helps:

- Essential for energy metabolism via CoA
- Supports adrenal hormone production
- Promotes healthy skin and wound healing
- Supports synthesis of neurotransmitters
- Helps reduce stress response
- Supports healthy cholesterol levels

Vitamin B5-rich foods:

- Beef liver
- Sunflower seeds
- Chicken
- Tuna
- Avocado
- Mushrooms
- Sweet potato
- Lentils
- Eggs
- Milk and yogurt

Signs of deficiency:

- Fatigue and irritability
- Insomnia
- Stomach pain and nausea
- Numbness or burning in hands and feet
- Muscle cramps
- Headaches
- "Burning feet" syndrome

Optimal Dosages:

- General health: 250–500 mg daily
- Adrenal and stress support: 500–1,000 mg daily
- Acne/skin support: 1,000–2,000 mg daily (divided doses)
- Best taken as pantothenic acid for enhanced bioavailability and cholesterol benefits
- Take with meals to reduce any digestive sensitivity



VITAMIN B6 (PYRIDOXINE)

Vitamin B6 is one of the most versatile B vitamins, serving as a cofactor in over 100 enzyme reactions—primarily involving amino acid metabolism. It is essential for the production of neurotransmitters like serotonin, dopamine, and GABA, making it deeply tied to mood regulation, sleep, and cognitive function.

How it helps:

- Supports production of serotonin, dopamine & GABA
- Promotes healthy mood and sleep
- Supports immune function
- Reduces homocysteine levels (heart health)
- Essential for hemoglobin production
- Supports brain health and development

Vitamin B6-rich foods:

- Chickpeas
- Beef liver
- Tuna and salmon
- Chicken and turkey
- Potatoes
- Bananas
- Fortified cereals
- Pistachios
- Avocado
- Spinach

Signs of deficiency:

- Depression, anxiety, and irritability
- Confusion and poor concentration
- Weakened immune function
- Anemia
- Cracked lips and mouth sores
- Skin rashes (seborrheic dermatitis)
- Nerve pain or numbness

Optimal Dosages:

- General health: 25–50 mg daily
- Mood, PMS, and hormone support: 50–100 mg daily
- Always use pyridoxal-5-phosphate (P5P), the active form; standard pyridoxine HCl at high doses long-term has been linked to nerve toxicity
- Do not exceed 200 mg daily long-term without practitioner supervision



VITAMIN B7 (BIOTIN)

Biotin is a water-soluble B vitamin that serves as an essential cofactor for five carboxylase enzymes involved in critical metabolic processes including fatty acid synthesis, amino acid metabolism, and glucose production. Often called the "beauty vitamin," biotin is widely recognized for its role in hair, skin, and nail health—but its metabolic and neurological functions are equally important and frequently overlooked.

How it helps:

- Supports healthy hair, skin, and nails
- Essential for fat, carbohydrate, and protein metabolism
- Supports healthy blood sugar regulation
- Promotes healthy nerve function
- Supports thyroid and adrenal function
- Important during pregnancy for fetal development
- May support MS and other neurological conditions

Biotin-rich foods:

- Beef liver
- Egg yolk (cooked)
- Salmon
- Sardines
- Sunflower seeds
- Sweet potato
- Almonds
- Spinach
- Broccoli
- Dairy products

Signs of deficiency:

- Hair thinning or loss
- Brittle nails
- Skin rashes, particularly around the face
- Fatigue and lethargy
- Depression and mood changes
- Numbness or tingling in extremities
- Muscle pain and cramps
- Cognitive impairment

Optimal Dosages:

- General health & metabolism: 1,000–2,500 mcg daily
- Hair, skin & nail support: 2,500–5,000 mcg daily
- Blood sugar regulation: 2,000–8,000 mcg daily (often combined with chromium)
- Note: Raw egg whites contain avidin, a protein that blocks biotin absorption—avoid regularly consuming raw eggs
- High-dose biotin can interfere with certain thyroid and cardiac lab tests—inform your doctor before testing



FOLATE (VITAMIN B9)

Folate (vitamin B9) occurs naturally in many foods. Folic acid is the synthetic form of folate that some food manufacturers add to fortify foods. Some people with certain MTHFR gene variants may have reduced ability to convert folic acid efficiently.

How it helps:

- Helps your body produce red blood cells
- Needed to make and repair DNA
- Supports healthy growth and development during pregnancy
- Improves cognition

Vitamin B9-rich foods:

- Leafy greens
- Asparagus
- Brussels sprouts
- Beans
- Broccoli
- Avocado
- Orange
- Mango
- Eggs

Signs of deficiency:

- Anemia
- Fatigue
- Trouble concentrating
- Depression
- Mouth ulcers
- Sore and red tongue
- Birth defects
- Fertility issues

Optimal Dosages:

- General health: 400–800 mcg daily
- Pregnancy/preconception: 800–1,000 mcg daily (critical for neural tube development)
- Cardiovascular/homocysteine support: 800–2,000 mcg daily
- Always choose methylfolate (5-MTHF), the active form. Standard folic acid is synthetic and cannot be properly converted by those with the common MTHFR gene mutation (estimated to affect up to 40% of the population)
- Works synergistically with B12 and B6. These three should ideally be taken together for homocysteine management
- Do not supplement high-dose folate in isolation without adequate B12



VITAMIN B12

Vitamin B12, also known as cobalamin, is mostly found in animal sources of food. So, for vegans or those who eat a plant-based diet, a B12 supplement is a wise move.

How it helps:

- Helps your body form red blood cells to prevent anemia
- Supports healthy bones
- Promotes a healthy nervous system
- Helps your body produce energy
- Plays a role in DNA formation

Vitamin B12-rich foods:

- Beef
- Chicken
- Salmon
- Sardines
- Tuna
- Clams
- Eggs
- Milk
- Nutritional Yeast

Signs of deficiency:

- Fatigue
- Weakness
- Tingling in fingers and toes
- Anemia
- Poor memory
- Depression
- Shortness of breath
- Pale skin

Optimal Dosages:

- General health: 500–1,000 mcg daily
- Neurological support/deficiency recovery: 1,000–5,000 mcg daily
- Seniors and those with absorption issues: 1,000 mcg daily sublingual or higher
- Always choose methylcobalamin or adenosylcobalamin, the active forms. Avoid cyanocobalamin, the cheap synthetic form found in most grocery store supplements
- Vegans and vegetarians are at particularly high risk of deficiency, as B12 is found almost exclusively in animal products
- Those on Metformin or proton pump inhibitors (PPIs) are at significantly elevated risk of depletion and should supplement regularly
- Sublingual delivery bypasses absorption issues in the gut and is strongly preferred over standard capsules



VITAMIN E

Vitamin E is a fat-soluble antioxidant that exists in eight chemical forms, with alpha-tocopherol being the most active in humans. It protects cell membranes from oxidative damage, supports immune function, and plays an important role in skin health and cardiovascular protection. It works synergistically with vitamin C and selenium.

How it helps:

- Powerful antioxidant – protects cells from oxidative damage
- Supports immune function
- Promotes healthy skin and wound healing
- Supports cardiovascular health
- Protects eye health
- Works synergistically with Vitamin C and selenium
- Supports healthy brain aging

Vitamin E-rich foods:

- Wheat germ oil
- Sunflower seeds
- Almonds
- Hazelnuts
- Peanut butter
- Avocado
- Spinach and leafy greens
- Butternut squash
- Olive oil
- Salmon

Signs of deficiency:

- Muscle weakness
- Nerve damage (peripheral neuropathy)
- Vision problems
- Weakened immune response
- Difficulty with coordination and walking
- Dry or damaged skin
- Fatigue

Optimal Dosages:

- General health: 200–400 IU daily
- Therapeutic/antioxidant support: 400–800 IU daily
- Always choose mixed tocopherols (full spectrum); avoid synthetic dl-alpha-tocopherol
- Take with a fat-containing meal for optimal absorption
- Those on blood thinners should consult a practitioner before supplementing



VITAMIN K



Vitamin K is a fat-soluble vitamin that exists in two primary forms with distinct roles and sources—K1 (phyloquinone) found in leafy green vegetables and primarily involved in blood clotting and K2 (menaquinone) found in fermented foods and animal products, which plays the critical role of directing calcium to bones and away from soft tissues and arteries. K2 is the form that has generated the most excitement in modern nutritional research, with profound implications for cardiovascular health, bone density, and cancer prevention. Despite eating plenty of leafy greens, most people are significantly deficient in vitamin K2, the form that matters most beyond basic clotting function.

How it helps:

- K1: essential for healthy blood clotting cascade
- K2: directs calcium into bones – supports bone density and prevents osteoporosis
- K2: prevents arterial calcification – protects cardiovascular health
- K2: activates osteocalcin – the protein that binds calcium into bone matrix
- K2: activates Matrix GLA Protein (MGP) – the most potent inhibitor of arterial calcification known
- Works synergistically with vitamin D3 and calcium – the triad for bone and cardiovascular health
- Supports healthy brain function – K2 supports myelin sheath integrity
- Emerging research in cancer prevention
- Supports healthy insulin sensitivity
- Supports kidney health – prevents soft tissue calcification

Signs of deficiency:

- Easy bruising and poor wound clotting (K1)
- Poor bone density and increased fracture risk (K2)
- Arterial calcification and cardiovascular stiffness (K2)
- Dental decay and poor dental mineralization
- Elevated cardiovascular disease risk
- Varicose veins
- Brain fog and poor cognitive function
- Kidney stones (calcium deposited incorrectly)
- Joint calcification and stiffness

Vitamin K-rich foods:

K1 sources:

- Kale and collard greens
- Spinach
- Broccoli
- Brussels sprouts
- Parsley

K2 sources:

- Natto (fermented soybeans – richest K2 source by far)
- Hard and soft aged cheeses
- Egg yolks (pasture-raised)
- Butter and ghee (grass-fed)
- Chicken liver
- Beef liver
- Fatty fish

Optimal Dosages:

- Vitamin K1: 100–200 mcg daily – generally sufficient from dietary leafy greens
- Vitamin K2 MK-4: 1,000–5,000 mcg (1–5 mg) daily – shorter acting, requires multiple doses
- Vitamin K2 MK-7: 100–360 mcg daily – preferred form; longer half-life, once daily dosing effective
- MK-7 is the most bioavailable and longest-acting form – strongly preferred over MK-4 for supplementation
- Always take vitamin K2 alongside vitamin D3 – they work in tandem and D3 without K2 may increase risk of soft tissue calcification
- Take with a fat-containing meal – fat soluble
- Those on warfarin or other anticoagulants must consult their doctor before supplementing vitamin K in any form – K1 directly affects INR; K2 at supplemental doses has less effect but caution is still warranted
- Pairs powerfully with calcium, magnesium, and vitamin D3 for the complete bone and cardiovascular health protocol

VITAMIN C

Vitamin C (ascorbic acid) is perhaps the most widely recognized vitamin in the world, yet its full therapeutic potential is dramatically underappreciated. It is a water-soluble vitamin and one of the most powerful antioxidants in the body, essential for collagen synthesis, immune function, neurotransmitter production, iron absorption, and adrenal hormone synthesis. Unlike most mammals, humans have lost the ability to synthesize vitamin C endogenously. Therefore, adequate dietary and supplemental intake is critical. Under conditions of stress, illness, or oxidative burden, requirements increase dramatically beyond what diet alone can realistically provide.

How it helps:

- Powerful antioxidant – protects cells from oxidative damage
- Essential for collagen synthesis – skin, joints, gut, and blood vessels
- Supports and enhances immune function at multiple levels
- Enhances non-heme iron absorption from plant foods
- Supports adrenal hormone synthesis – depleted rapidly under stress
- Supports healthy neurotransmitter production – dopamine, norepinephrine
- Regenerates vitamin E after it neutralizes free radicals
- Supports cardiovascular health and healthy blood pressure
- Supports healthy eye health – reduces cataract and macular degeneration risk
- Supports liver detoxification and phase I reactions

Signs of deficiency:

- Frequent infections and slow recovery from illness
- Fatigue and low energy
- Poor wound healing
- Easy bruising
- Bleeding gums and poor dental health
- Joint pain and poor connective tissue integrity
- Dry and rough skin
- Irritability and depression
- In severe deficiency, scurvy (rare in developed countries, but subclinical deficiency is widespread)
- Anemia (via reduced iron absorption)

Vitamin C-rich foods:

- Kakadu plum (highest known food source)
- Camu camu
- Acerola cherry
- Guava
- Red and yellow bell peppers
- Kiwi fruit
- Broccoli and Brussels sprouts
- Strawberries
- Citrus fruits
- Papaya

Optimal Dosages:

- General health and antioxidant support: 500–1,000 mg daily
- Immune maintenance: 1,000–2,000 mg daily
- Active infection or illness: 3,000–8,000 mg daily in divided doses – bowel tolerance dosing
- Therapeutic and high oxidative stress: titrate to bowel tolerance – the dose just below which loose stools occur; this varies from 4 g to over 20g daily depending on health status
- Always use divided doses throughout the day – vitamin C has a short half-life of 30 minutes in plasma
- Liposomal vitamin C offers significantly enhanced bioavailability and allows higher effective doses without digestive side effects
- Sodium ascorbate or calcium ascorbate (buffered forms) are gentler on digestion than pure ascorbic acid
- Those with a history of kidney stones (calcium oxalate) should use caution at high doses and stay well hydrated
- Pairs powerfully with zinc, quercetin, and glutathione for immune and antioxidant synergy



VITAMIN D

Vitamin D is technically a fat-soluble prohormone rather than a true vitamin—the body synthesizes it from cholesterol upon exposure to UVB sunlight, and it acts on receptors found in virtually every tissue and cell in the body. Vitamin D deficiency is the most prevalent nutritional deficiency in the world, affecting an estimated 1 billion people globally, driven by indoor lifestyles, sunscreen use, geographical latitude, skin pigmentation, and aging. Its effects extend far beyond bone health—vitamin D is deeply involved in immune regulation, mood, cardiovascular function, metabolic health, and cancer prevention.

How it helps:

- Essential for calcium absorption and bone mineralization
- Regulates immune function – both innate and adaptive immunity
- Supports healthy mood and reduces risk of depression and seasonal affective disorder
- Supports cardiovascular health and healthy blood pressure
- Supports healthy blood sugar and insulin sensitivity
- Supports healthy muscle function and reduces fall risk in older adults
- Supports healthy brain function and cognitive aging
- Reduces risk of autoimmune conditions
- Supports healthy respiratory function
- Emerging research in cancer prevention and mortality reduction

Signs of deficiency:

- Fatigue and low energy
- Bone pain and poor bone density
- Muscle weakness and aches
- Frequent infections and poor immune response
- Depression and seasonal mood changes
- Brain fog and poor cognitive function
- Hair loss
- Poor wound healing
- Gut dysfunction – vitamin D receptors throughout the gut lining
- Increased autoimmune activity

Vitamin D-rich foods:

- Cod liver oil (richest food source)
- Wild caught salmon
- Mackerel and sardines
- Herring
- Tuna
- Egg yolks (pasture-raised)
- Beef liver
- Mushrooms exposed to UV light
- Fortified dairy and plant milks
- Fortified cereals

Optimal Dosages:

- General health maintenance: 2,000–4,000 IU daily
- Correcting deficiency: 5,000–10,000 IU daily until levels are restored
- Maintenance at optimal blood levels: 4,000–6,000 IU daily for most adults
- Target blood level: 60–80 ng/mL (150–200 nmol/L)—significantly higher than the conventional sufficiency threshold of 20 ng/mL
- Always take vitamin D3 (cholecalciferol)—not D2 (ergocalciferol), which is significantly less effective
- Always pair with vitamin K2 (MK-7)—directs calcium into bones and away from arteries; critical safety cofactor
- Take with magnesium—essential for vitamin D conversion and activation; magnesium deficiency renders vitamin D supplementation ineffective
- Take with a fat-containing meal for optimal absorption
- Test 25(OH)D blood levels before and during supplementation to guide dosing
- Those with granulomatous conditions (sarcoidosis, TB) should consult a practitioner before supplementing



MINERALS



MAGNESIUM

Magnesium is the fourth most abundant mineral in the human body and a cofactor in over 300 enzymatic reactions, touching virtually every system and function in the body. It is essential for energy production, protein synthesis, muscle and nerve function, blood sugar regulation, and bone development. Despite its critical importance, magnesium deficiency is one of the most prevalent nutritional deficiencies in the modern world, estimated to affect up to 75% of the population—largely due to soil depletion, food processing, chronic stress, and widespread use of medications that deplete magnesium levels.

How it helps:

- Cofactor in over 300 enzymatic reactions throughout the body
- Essential for ATP energy production — every energy molecule requires magnesium
- Supports healthy muscle function and prevents cramping
- Supports healthy nerve transmission and nervous system calm
- Promotes healthy sleep quality and sleep onset
- Supports healthy blood sugar and insulin sensitivity
- Supports healthy blood pressure and cardiovascular function
- Essential for bone density — works with calcium, vitamin D, and K2
- Supports healthy mood — deficiency strongly linked to anxiety and depression
- Supports healthy bowel regularity
- Activates vitamin D — magnesium deficiency renders vitamin D supplementation ineffective

Signs of deficiency:

- Muscle spasms and cramps
- Muscle weakness
- Fatigue
- Loss of appetite
- Nausea
- High blood pressure
- Abnormal heartbeat

Optimal Dosages:

- General health and maintenance: 300–400 mg daily
- Sleep, anxiety, and stress support: 400–600 mg daily
- Athletic performance and muscle support: 400–600 mg daily
- Therapeutic support: up to 800 mg daily in divided doses
- Form matters enormously—choose based on your primary need:
- Magnesium glycinate—best for sleep, anxiety, and stress; highly bioavailable and gentle on digestion
- Magnesium malate—best for energy production and muscle pain; excellent for fibromyalgia
- Magnesium threonate—best for brain health and cognitive function; uniquely crosses the blood-brain barrier
- Magnesium citrate—good general absorption; mild laxative effect useful for constipation
- Magnesium taurate—best for cardiovascular health and blood pressure
- Magnesium chloride—excellent topical form for muscle soreness and transdermal absorption
- Avoid magnesium oxide—extremely poor bioavailability despite being the most common form in cheap supplements
- Take in the evening—magnesium's calming properties make it ideal before bed
- Split doses if taking higher amounts—improves absorption and reduces digestive sensitivity
- Those on diuretics, PPIs, or antibiotics are at significantly elevated risk of depletion



IRON

Iron is an essential mineral and a core component of hemoglobin, the protein in red blood cells that carries oxygen from the lungs to every cell in the body. It is also a critical component of myoglobin in muscle tissue and numerous enzymes involved in energy production and cellular respiration. Iron deficiency is the most common nutritional deficiency worldwide, affecting an estimated 2 billion people, particularly women of reproductive age, pregnant women, children, and those following plant-based diets. However, iron is a double-edged mineral—both deficiency and excess are harmful, making appropriate testing before supplementation critically important.

How it helps:

- Essential component of hemoglobin – oxygen transport throughout the body
- Essential component of myoglobin – oxygen storage in muscle tissue
- Supports healthy energy production and reduces fatigue
- Supports healthy immune function
- Supports healthy cognitive function and concentration
- Essential for healthy growth and development in children
- Supports healthy thyroid function
- Supports healthy neurotransmitter synthesis – dopamine and serotonin
- Supports healthy pregnancy outcomes
- Supports healthy athletic performance and endurance.

Signs of deficiency:

- Fatigue and low energy – most common symptom
- Pale skin, gums, and inner eyelids
- Shortness of breath on exertion
- Brain fog and poor concentration
- Hair loss and brittle nails
- Spoon-shaped nails (koilonychia)
- Restless legs syndrome
- Cold hands and feet
- Frequent headaches
- Pica – craving non-food items such as ice, dirt, or chalk
- Poor immune function and frequent infections

Iron-rich foods:

- Beef liver (richest heme source)
- Oysters and clams
- Beef and lamb
- Sardines and tuna
- Dark turkey meat
- Tofu (non-heme)
- Lentils and legumes (non-heme)
- Spinach (non-heme)
- Pumpkin seeds (non-heme)
- Dark chocolate (non-heme)

Optimal Dosages:

- Always test ferritin and full iron panel before supplementing—iron supplementation without confirmed deficiency can be harmful
- Iron deficiency without anemia: 25–65 mg elemental iron daily
- Iron deficiency anemia: 100–200 mg elemental iron daily in divided doses under practitioner supervision
- Maintenance for at-risk groups (menstruating women, vegetarians): 18–25 mg daily
- Always choose highly bioavailable forms—iron bisglycinate (gentle iron) is strongly preferred; it causes significantly less digestive upset than ferrous sulfate
- Ferrous bisglycinate at lower doses is often as effective as higher doses of ferrous sulfate with far better tolerability
- Take on an empty stomach for best absorption—if digestive upset occurs, take with a small amount of food
- Take with vitamin C—dramatically enhances non-heme iron absorption
- Never take iron alongside calcium, zinc, or magnesium—they compete for absorption; separate by at least 2 hours
- Avoid taking with coffee, tea, or dairy—tannins and calcium significantly inhibit absorption
- Optimal ferritin target: 50–100 ng/mL—conventional lab ranges often flag deficiency too late
- Men and post-menopausal women should be particularly cautious about iron supplementation—elevated ferritin is associated with oxidative stress and cardiovascular disease

SELENIUM

Selenium is an essential trace mineral that serves as a critical cofactor for a family of selenoproteins—enzymes with powerful antioxidant, anti-inflammatory, thyroid, and immune functions. It is most concentrated in the thyroid gland, which contains more selenium per gram of tissue than any other organ, reflecting its indispensable role in thyroid hormone metabolism. Selenium is also essential for the body's own production of glutathione peroxidase, one of the most important endogenous antioxidant enzymes. Selenium levels are heavily dependent on the selenium content of the soil in which food is grown, creating significant geographical variation in deficiency rates.

How it helps:

- Essential cofactor for glutathione peroxidase — master antioxidant enzyme
- Critical for thyroid hormone conversion — T4 to active T3
- Supports healthy thyroid function and protects thyroid tissue
- Supports healthy immune function
- Powerful anti-inflammatory effects
- Supports cardiovascular health
- Supports male fertility and sperm motility
- Supports healthy cognitive function and may reduce dementia risk
- Supports liver health and detoxification
- Essential companion nutrient to iodine for thyroid health

Signs of deficiency:

- Thyroid dysfunction—poor T4 to T3 conversion
- Fatigue and low energy
- Brain fog and poor cognitive function
- Weakened immune function and frequent illness
- Hair loss and brittle nails
- Muscle weakness and pain
- Reproductive issues and poor fertility
- Poor mood and depression
- Elevated inflammation and oxidative stress
- Keshan disease (severe deficiency—cardiomyopathy)

Selenium-rich foods:

- Brazil nuts (richest source, 1–2 nuts meets daily needs)
- Oysters
- Tuna and halibut
- Sardines
- Shrimp
- Beef and lamb
- Chicken and turkey
- Eggs
- Sunflower seeds
- Shiitake mushrooms

Optimal Dosages:

- General health and antioxidant support: 100–200 mcg daily
- Thyroid support: 200 mcg daily—the most researched dose for thyroid function
- Immune and anti-cancer support: 200–400 mcg daily
- Hashimoto's thyroiditis: 200 mcg daily—well supported in clinical research for reducing thyroid antibodies
- Selenium has a narrow therapeutic window—do not exceed 400 mcg daily from all sources combined
- Choose selenomethionine for general health—the most bioavailable organic form
- Choose sodium selenite alongside selenomethionine for broader selenoprotein support
- Brazil nuts are the richest food source—1–2 Brazil nuts daily provides approximately 100–200 mcg; an easy and effective dietary strategy
- Always pair selenium with iodine for comprehensive thyroid support
- Pairs synergistically with vitamin E—selenium and E work together as an antioxidant team



ZINC

Zinc is an essential trace mineral involved in over 300 enzymatic reactions and required for the activity of more than 1,000 transcription factors—proteins that regulate gene expression throughout the body. It is critical for immune function, wound healing, protein synthesis, DNA synthesis, cell division, and sensory function. Zinc is second only to iron as the most abundant trace mineral in the body, yet deficiency is extremely common, affecting an estimated 2 billion people globally. It is particularly prevalent in those eating plant-heavy diets due to the presence of phytates in grains and legumes that significantly inhibit zinc absorption.

How it helps:

- Essential for healthy immune function — particularly T-cell development and function
- Supports healthy wound healing and tissue repair
- Critical for protein and DNA synthesis
- Supports healthy skin and reduces acne
- Essential for healthy taste and smell
- Supports healthy testosterone production and male reproductive health
- Supports healthy growth and development
- Powerful antioxidant cofactor — component of superoxide dismutase
- Supports healthy thyroid function
- Supports healthy brain function and neurotransmitter activity
- Supports healthy insulin production and blood sugar regulation
- Acts as a zinc ionophore with quercetin — potent antiviral mechanism

Signs of deficiency:

- Frequent infections and poor immune function
- Poor wound healing
- Loss of taste and smell
- Acne and poor skin health
- Hair loss
- Low testosterone and poor male reproductive health
- Growth delays in children
- Poor appetite
- Brain fog and cognitive impairment
- White spots on fingernails
- Stretch marks
- Night blindness

Zinc-rich foods:

- Oysters (richest source by far)
- Beef and lamb
- Pumpkin seeds
- Hemp seeds
- Lentils and chickpeas
- Cashews and almonds
- Chicken and turkey (dark meat)
- Eggs
- Tofu
- Shiitake mushrooms

Optimal Dosages:

- General health and immune maintenance: 15–30 mg daily
- Therapeutic immune support and wound healing: 30–50 mg daily
- Male reproductive health and testosterone support: 30–45 mg daily
- Acne and skin support: 30–45 mg daily
- Always balance zinc with copper—supplement 1–2 mg copper for every 15 mg zinc to prevent copper depletion; this is one of the most important mineral interactions in nutrition
- Choose highly bioavailable forms—zinc bisglycinate or zinc picolinate are strongly preferred over zinc oxide (very poorly absorbed)
- Zinc carnosine is specifically beneficial for gut lining repair and H. pylori support
- Take with food to prevent nausea—zinc on an empty stomach commonly causes digestive upset
- Separate from iron and calcium supplements by at least 2 hours—they compete for absorption
- Those with Crohn's disease, malabsorption, or alcoholism are at particularly high risk of deficiency
- Phytate-rich diets (grains, legumes, seeds) significantly reduce zinc absorption—vegetarians and vegans need approximately 50% more dietary zinc than omnivores



BORON

Boron is a trace mineral that has only recently gained attention in nutritional science, yet its effects are far-reaching. It plays a significant role in bone metabolism, hormone regulation, and brain function. Boron enhances the body's ability to use other key nutrients including calcium, magnesium, and vitamin D, making it an important supporting player in overall mineral balance.

How it helps:

- Supports bone density and strength
- Enhances absorption and utilization of calcium, magnesium, and vitamin D
- Supports healthy testosterone and estrogen levels
- Promotes brain health and cognitive function
- Reduces inflammation
- Supports joint health and may reduce arthritis symptoms
- Supports healthy wound healing

Boron-rich foods:

- Prunes
- Raisins
- Avocado
- Almonds
- Peanuts
- Apricots
- Red grapes
- Apples
- Chickpeas
- Broccoli

Signs of deficiency:

- Poor bone density
- Joint pain and stiffness
- Hormonal imbalances
- Poor memory and concentration
- Slow wound healing
- Elevated inflammatory markers
- Poor magnesium and calcium utilization

Optimal Dosages:

- General health: 3–6 mg daily
- Bone, joint & hormone support: 6–12 mg daily
- Best taken with meals
- Works synergistically with magnesium, calcium, and vitamin D—ideally taken together
- Most diets are significantly low in boron due to poor soil quality



CALCIUM

Calcium is the most abundant mineral in the human body, with 99% stored in bones and teeth. Beyond its structural role, calcium is essential for muscle contraction, nerve transmission, hormone secretion, and blood clotting. Despite its widespread recognition, calcium supplementation is widely misunderstood. Form, cofactors, and timing matter enormously for both efficacy and safety.

How it helps:

- Builds and maintains strong bones and teeth
- Essential for muscle contraction including the heart
- Supports nerve transmission
- Promotes healthy blood clotting
- Supports hormone and enzyme secretion
- Works with vitamin D, K2, and magnesium for bone metabolism
- Supports healthy blood pressure

Calcium-rich foods:

- Dairy products (milk, cheese, yogurt)
- Sardines and canned salmon (with bones)
- Leafy greens (kale, bok choy, broccoli)
- Almonds
- Tofu (calcium-set)
- Fortified plant milks
- White beans
- Figs
- Sesame seeds and tahini
- Edamame

Signs of deficiency:

- Muscle cramps and spasms
- Numbness and tingling in fingers
- Brittle nails
- Dental problems
- Osteopenia and osteoporosis
- Irregular heartbeat
- Fatigue and depression
- Poor blood clotting

Optimal Dosages:

- General health: 500–1,000 mg daily (dietary sources preferred)
- Always pair with vitamin K2 (MK-7) to direct calcium into bones and away from arteries
- Always pair with vitamin D3 for proper absorption
- Use calcium citrate over calcium carbonate—better absorbed, especially in those with low stomach acid
- Split doses—calcium is best absorbed in amounts of 500 mg or less at a time
- Do not supplement calcium in isolation—the K2/D3/magnesium triad is essential for safe and effective use

CHROMIUM

Chromium is an essential trace mineral that plays a central role in macronutrient metabolism and insulin signaling. It enhances the action of insulin, helping cells take up glucose more efficiently, making it particularly valuable for blood sugar regulation, energy balance, and carbohydrate metabolism. It is frequently depleted by high-sugar diets, stress, and intense exercise.

How it helps:

- Enhances insulin sensitivity and glucose uptake
- Supports healthy blood sugar regulation
- Reduces sugar and carbohydrate cravings
- Supports healthy cholesterol and triglyceride levels
- Promotes lean body composition
- Supports energy metabolism
- May support mood and reduce depression linked to blood sugar dysregulation

Signs of deficiency:

- Blood sugar dysregulation
- Strong sugar and carbohydrate cravings
- Fatigue after meals
- Difficulty losing weight
- High triglycerides
- Anxiety and mood swings
- Impaired glucose tolerance

Chromium-rich foods:

- Broccoli
- Beef
- Liver
- Whole grains
- Green beans
- Potatoes
- Garlic
- Basil
- Turkey breast
- Black pepper

Optimal Dosages:

- General health: 200–400 mcg daily
- Blood sugar/insulin support: 400–1,000 mcg daily
- Always choose chromium picolinate or chromium polynicotinate for best bioavailability
- Best taken with meals containing carbohydrates
- Pairs well with biotin (B7) for enhanced blood sugar regulation
- High-sugar diets significantly deplete chromium—those eating a standard Western diet should consider supplementing



COPPER

Copper is an essential trace mineral that acts as a cofactor for numerous critical enzymes involved in energy production, iron metabolism, antioxidant defense, and connective tissue formation. It is one of the most important yet overlooked minerals in modern nutrition—particularly because zinc supplementation, now extremely common, directly depletes copper. These two minerals must always be considered together.

How it helps:

- Essential cofactor for energy production (cytochrome c oxidase)
- Supports iron metabolism and red blood cell formation
- Critical for collagen and elastin synthesis
- Powerful antioxidant defense (superoxide dismutase)
- Supports healthy immune function
- Promotes brain and nervous system health
- Supports cardiovascular health
- Essential for melanin production (skin and hair pigment)

Copper-rich foods:

- Beef liver
- Oysters and shellfish
- Spirulina
- Dark chocolate
- Almonds and cashews
- Sunflower seeds
- Shiitake mushrooms
- Lobster
- Leafy greens
- Black pepper

Signs of deficiency:

- Fatigue and weakness
- Frequent illness/weakened immunity
- Premature graying of hair
- Pale skin
- Bone fragility
- Poor wound healing
- Neurological problems—numbness, coordination issues
- Anemia unresponsive to iron

Optimal Dosages:

- General health: 1–2 mg daily
- Therapeutic support: 2–4 mg daily
- Critical: maintain a zinc-to-copper ratio of approximately 10:1—if supplementing 30 mg zinc, supplement 2–3 mg copper
- Use copper bisglycinate or copper gluconate for best tolerability
- Take separately from zinc if possible—they compete for absorption
- Copper IUDs can elevate copper levels—women using them should be tested before supplementing



IODINE

Iodine is an essential trace mineral whose primary role is in the production of thyroid hormones—T3 and T4—which regulate metabolism, growth, and development throughout the body. It is one of the most globally deficient nutrients, yet it remains underappreciated in mainstream health conversations. Iodine also has important roles in breast tissue health, immune function, and detoxification.

How it helps:

- Essential for thyroid hormone production (T3 and T4)
- Regulates metabolism and body weight
- Supports healthy brain development and cognitive function
- Promotes breast, ovarian, and prostate tissue health
- Supports detoxification of halides (fluoride, bromide, chloride)
- Supports immune function
- Promotes healthy skin

Iodine-rich foods:

- Seaweed (nori, kelp, wakame)
- Cod and other white fish
- Shrimp
- Oysters
- Dairy products
- Eggs
- Prunes
- Lima beans
- Iodized salt
- Tuna

Signs of deficiency:

- Hypothyroid symptoms (fatigue, weight gain, cold intolerance)
- Goiter (enlarged thyroid)
- Brain fog and poor concentration
- Dry skin and hair
- Hair loss
- Fibrocystic breast changes
- Depression
- Developmental delays in children

Optimal Dosages:

- General health: 150–500 mcg daily
- Thyroid and breast tissue support: 1–3 mg (1,000–3,000 mcg) daily—Lugol's iodine is commonly used at this range
- Higher therapeutic doses (12.5 mg+) used by some practitioners but require careful monitoring
- Always supplement selenium alongside iodine to protect the thyroid gland
- Those with Hashimoto's thyroiditis should work with a practitioner before supplementing iodine
- Avoid iodine from kelp supplements—doses are inconsistent and poorly standardized

LITHIUM (LOW-DOSE)

Low-dose lithium is a naturally occurring trace mineral found in drinking water and certain foods. It is distinct from the high pharmaceutical doses used in psychiatry. At nutritional doses, lithium has remarkable neuroprotective properties, supporting brain cell longevity, mood stability, and cognitive function. Research increasingly suggests that populations with higher lithium levels in their water supply have significantly lower rates of suicide, dementia, and violent crime.

How it helps:

- Powerful neuroprotective effects – supports brain cell longevity
- Supports mood stability and emotional resilience
- May reduce risk of neurodegenerative diseases including Alzheimer's
- Supports healthy B12 transport into the brain
- Promotes healthy serotonin and dopamine signaling
- May reduce impulsivity and aggression
- Supports healthy sleep patterns

Signs of deficiency:

- Mood instability and irritability
- Depression and anxiety
- Poor impulse control
- Sleep disturbances
- Cognitive decline
- Increased risk of neurodegenerative conditions
- Poor stress resilience

Lithium-rich foods:

- Drinking water (varies significantly by region)
- Grains and cereals
- Vegetables (especially mustard, kelp, pistachios)
- Dairy products
- Fish
- Eggs
- Potatoes
- Tomatoes

Optimal Dosages:

- General health and neuroprotection: 1–5 mg daily (as lithium orotate or lithium aspartate)
- Mood and cognitive support: 5–20 mg daily
- This is a nutritional/trace dose—vastly different from pharmaceutical lithium carbonate (which is 10–30 times higher and requires blood monitoring)
- Lithium orotate is the preferred supplemental form for bioavailability
- Even at low doses, those with kidney concerns or on medications should consult a practitioner



POTASSIUM

Potassium is the third most abundant mineral in the body and the primary electrolyte inside cells. It works in constant balance with sodium to regulate fluid balance, nerve signaling, and muscle contraction, including the heartbeat. Despite being found abundantly in whole foods, most people on a modern diet consume far less than optimal, contributing to widespread cardiovascular and metabolic issues.

How it helps:

- Regulates fluid and electrolyte balance
- Supports healthy blood pressure (counteracts sodium)
- Essential for heart rhythm and cardiovascular health
- Supports muscle contraction and prevents cramping
- Promotes healthy nerve transmission
- Supports kidney health and reduces kidney stone risk
- Supports bone density

Potassium-rich foods:

- Avocado
- Sweet potato
- Spinach and leafy greens
- Bananas
- Coconut water
- White beans
- Salmon
- Beets
- Potatoes
- Dried apricots

Signs of deficiency:

- Muscle weakness and cramps
- Fatigue and lethargy
- Heart palpitations or irregular heartbeat
- High blood pressure
- Constipation
- Tingling and numbness
- Mood changes and depression
- Frequent urination

Optimal Dosages:

- General health: 1,000–3,500 mg daily from food and supplements combined
- Supplement doses are typically capped at 99 mg per tablet by regulators—higher therapeutic doses should come primarily from food
- Use potassium citrate or potassium glycinate for best absorption and tolerability
- Those on ACE inhibitors, ARBs, or potassium-sparing diuretics must consult a practitioner before supplementing
- Works best in balance with magnesium and sodium—address all three electrolytes together



SILICA

Silica, also known as silicon dioxide, is the second most abundant element on earth yet is frequently absent from discussions of human nutrition. It is a critical structural mineral for connective tissue, playing an essential role in the formation of collagen, elastin, and bone matrix. Silica is increasingly recognized for its role in healthy aging, particularly in maintaining the integrity of skin, hair, nails, joints, and arterial walls.

How it helps:

- Essential for collagen and elastin synthesis
- Promotes strong, healthy hair and nails
- Supports bone density and mineralization
- Supports healthy skin elasticity and wound healing
- Promotes joint health and cartilage integrity
- Supports cardiovascular health — maintains arterial wall flexibility
- May support healthy aluminum detoxification

Silica-rich foods:

- Oats and whole grains
- Bananas
- Green beans
- Beer (hops are high in silica)
- Leafy greens
- Brown rice
- Horsetail herb tea
- Cucumbers
- Bell peppers
- Mineral water (varies by source)

Signs of deficiency:

- Brittle hair and nails
- Premature skin aging and poor elasticity
- Poor bone density
- Joint pain and poor cartilage health
- Slow wound healing
- Weak connective tissue
- Cardiovascular stiffness

Optimal Dosages:

- General health: 5–10 mg daily
- Hair, skin, nail and connective tissue support: 10–30 mg daily
- Best forms: orthosilicic acid (most bioavailable), bamboo extract, or horsetail extract
- Silica from food sources is poorly absorbed—supplemental forms are significantly more bioavailable
- Works synergistically with collagen, vitamin C, and boron



VANADIUM

Vanadium is an ultra-trace mineral that has gained attention primarily for its insulin-mimicking properties and role in blood sugar metabolism. While deficiency is rarely recognized clinically, suboptimal vanadium levels may contribute to impaired glucose handling and metabolic dysfunction. It is one of the lesser-known but potentially valuable tools for metabolic health support.

How it helps:

- Mimics insulin action and supports glucose uptake
- Supports healthy blood sugar regulation
- May improve insulin sensitivity
- Supports healthy cholesterol and triglyceride levels
- Promotes bone and tooth mineralization
- Supports thyroid function
- May have antioxidant properties

Vanadium-rich foods:

- Mushrooms
- Shellfish
- Black pepper
- Parsley
- Dill
- Whole grains
- Spinach
- Olives
- Vegetable oils
- Radishes

Signs of deficiency:

- Impaired blood sugar regulation
- Elevated cholesterol and triglycerides
- Poor bone mineralization
- Slow growth and development
- Metabolic dysfunction

Optimal Dosages:

- General health: 10–30 mcg daily (from food is ideal)
- Metabolic/blood sugar support: 0.5–2 mg daily (as vanadyl sulfate)
- Use cautiously—vanadium has a relatively narrow therapeutic window
- Vanadyl sulfate is the most studied supplemental form
- Best used as part of a broader blood sugar support protocol alongside chromium and berberine
- Long-term, high-dose supplementation should be supervised by a practitioner



MOLYBDENUM

Molybdenum is an essential trace mineral that serves as a critical cofactor for four key enzymes in the body—sulfite oxidase, xanthine oxidase, aldehyde oxidase, and mitochondrial amidoxime reducing component (mARC). While required only in tiny amounts, its role in detoxification is profound, particularly in breaking down sulfites, a preservative found widely in processed foods and wine, and in metabolizing certain drugs and toxins. Molybdenum is one of the least discussed essential minerals, yet its deficiency has significant implications for detoxification capacity, sulfur metabolism, and overall cellular health. Most people obtain adequate molybdenum from food; however, poor soil quality, digestive malabsorption, and high sulfite exposure can all compromise status.

How it helps:

- Essential cofactor for sulfite oxidase — breaks down sulfites from food, drink, and metabolism
- Supports healthy detoxification of sulfur-containing compounds
- Supports healthy uric acid metabolism via xanthine oxidase
- Supports aldehyde detoxification — relevant in alcohol metabolism and candida die-off reactions
- Supports healthy copper metabolism and balance
- Promotes healthy liver function and phase I detoxification
- Supports healthy cellular energy metabolism
- May reduce symptoms associated with sulfite sensitivity
- Supports healthy gut environment during candida protocols
- Supports healthy nitrogen metabolism

Signs of deficiency:

- Sulfite sensitivity — headaches, flushing, and breathing difficulties after wine or preserved foods
- Poor tolerance of sulfur-containing foods (garlic, onions, cruciferous vegetables)
- Elevated uric acid and gout tendencies
- Poor detoxification capacity
- Fatigue and low energy
- Candida die-off reactions and poor tolerance of antifungal protocols
- Neurological symptoms in severe deficiency
- Elevated copper levels — molybdenum and copper are antagonistic
- Poor alcohol tolerance

Molybdenum-rich foods:

- Legumes including black beans, lentils, chickpeas (richest food sources)
- Beef liver and organ meats
- Whole grains including oats, buckwheat, and wheat
- Leafy green vegetables
- Nuts—particularly peanuts and almonds
- Dairy products
- Eggs
- Sunflower seeds
- Potatoes
- Tomatoes

Optimal Dosages:

- General health and detoxification support: 75–250 mcg daily
- Sulfite sensitivity and detox support: 250–500 mcg daily
- Candida protocol support: 250–500 mcg daily
- Molybdenum glycinate or sodium molybdate are the most bioavailable supplemental forms
- Most multivitamins and mineral complexes contain adequate molybdenum—check your existing supplements before adding a standalone product
- Molybdenum competes with copper—high-dose supplementation long term may deplete copper; monitor accordingly
- Do not exceed 2,000 mcg daily—the established upper tolerable intake level
- Those eating a varied whole food diet rich in legumes likely obtain sufficient molybdenum from food alone
- Best assessed as part of a comprehensive mineral panel before supplementing in isolation



AMINO ACIDS





GLYCINE

Glycine is the simplest and most abundant amino acid in the human body, yet it is frequently overlooked in nutritional discussions. It is a major component of collagen—making up roughly one third of its structure—and plays essential roles in detoxification, neurotransmission, and metabolic function. Modern diets, which favor muscle meat over connective tissue and organ meats, are significantly depleted in glycine, creating a widespread functional deficiency.

How it helps:

- Essential building block of collagen and connective tissue
- Supports liver detoxification (phase II conjugation)
- Acts as an inhibitory neurotransmitter – promotes calm and sleep
- Supports healthy blood sugar regulation
- Promotes gut lining integrity
- Works synergistically with NAC to produce glutathione
- Supports healthy creatine synthesis
- May reduce inflammation and oxidative stress

Signs of deficiency:

- Poor sleep quality
- Joint and connective tissue problems
- Poor wound healing
- Muscle weakness
- Digestive issues and leaky gut
- Impaired detoxification
- Anxiety and poor stress resilience
- Elevated inflammation

Glycine-rich foods:

- Bone broth
- Collagen peptides
- Pork skin and pork rinds
- Chicken skin
- Beef (especially tougher cuts with connective tissue)
- Gelatin
- Cod and other fish
- Dairy products
- Spinach
- Eggs

Optimal Dosages:

- General health and sleep support: 3–5 g daily (taken before bed is particularly effective)
- Collagen and connective tissue support: 5–10 g daily
- Liver detox and glutathione support: 3–5 g daily alongside NAC
- Glycine is exceptionally safe even at high doses—no established upper limit
- Powder form is practical and cost effective given the doses involved
- Found abundantly in bone broth and collagen peptides—dietary sources are highly encouraged alongside supplementation



L-ARGININE & L-CITRULLINE

L-arginine is a semi-essential amino acid and the primary precursor to nitric oxide (NO), a critical signaling molecule that relaxes and dilates blood vessels, supporting cardiovascular function, circulation, and cellular energy. L-citrulline is increasingly preferred over arginine as a supplement because it converts to arginine more efficiently in the body and has superior bioavailability. Together they form a powerful cardiovascular and performance-supporting duo.

How it helps:

- Primary precursor to nitric oxide – supports healthy circulation
- Supports cardiovascular health and healthy blood pressure
- Enhances athletic performance and exercise recovery
- Supports erectile function and sexual health
- Promotes healthy immune function
- Supports wound healing and tissue repair
- Supports growth hormone secretion
- May support kidney detoxification pathways

Signs of deficiency:

- Poor circulation
- High blood pressure
- Fatigue and poor exercise tolerance
- Slow wound healing
- Weakened immune function
- Erectile dysfunction
- Poor muscle recovery

L-Arginine / L-Citrulline-rich foods:

- Watermelon (exceptionally high in citrulline)
- Pumpkin seeds
- Turkey and chicken
- Pork
- Soybeans
- Peanuts
- Dairy products
- Chickpeas
- Lentils
- Spirulina

Optimal Dosages:

- L-Citrulline (preferred form): 3–6 g daily for general health; 6–8 g pre-workout for performance
- L-Arginine: 3–6 g daily—less preferred due to poorer bioavailability and potential to trigger cold sore outbreaks in herpes-susceptible individuals
- Citrulline malate (2:1 ratio) popular for athletic performance—6–8 g pre-exercise
- Best taken on an empty stomach for cardiovascular use
- Those with herpes simplex virus should use L-citrulline over arginine and balance with L-lysine
- Avoid high-dose arginine if prone to cold sores



L-GLUTAMINE

L-glutamine is the most abundant amino acid in the bloodstream and a critical fuel source for rapidly dividing cells—particularly the cells lining the gut wall and immune cells. It is considered conditionally essential, meaning the body's demand for it increases dramatically under physical stress, illness, surgery, or intense exercise. Its central role in gut barrier integrity makes it foundational for anyone dealing with digestive issues, leaky gut, or immune dysfunction.

How it helps:

- Primary fuel source for intestinal lining cells
- Supports and repairs gut barrier integrity (leaky gut)
- Supports healthy immune function
- Promotes muscle recovery and reduces exercise-induced muscle breakdown
- Supports liver detoxification
- Supports healthy acid-base balance in the kidneys
- May reduce sugar and alcohol cravings
- Supports healthy nitrogen balance

Signs of deficiency:

- Leaky gut and digestive dysfunction
- Frequent illness and poor immune response
- Slow muscle recovery
- Sugar and alcohol cravings
- Poor wound healing
- Fatigue and poor endurance
- Mood disturbances
- Impaired detoxification

L-Glutamine-Rich Foods:

- Beef
- Chicken
- Fish
- Eggs
- Dairy products (especially cottage cheese)
- Tofu
- Cabbage (raw is best, as cooking degrades glutamine)
- Spinach
- Bone broth
- Spirulina

Optimal Dosages:

- Gut health and repair: 5–10 g daily on an empty stomach
- Immune support: 5–10 g daily
- Athletic recovery: 10–15 g daily (split doses around training)
- Serious gut repair protocols: up to 20–40 g daily under practitioner supervision
- Powder form strongly preferred due to the doses required
- Do not mix with hot liquids—heat degrades glutamine
- Those with cancer, seizure disorders, or liver disease should consult a practitioner before supplementing at high doses



L-LYSINE

L-lysine is an essential amino acid, meaning the body cannot synthesize it and it must come entirely from diet. It is a cornerstone of collagen synthesis, calcium absorption, and immune function. Lysine is perhaps best known for its well-documented antiviral properties, particularly against the herpes simplex virus, where it directly competes with and inhibits arginine—the amino acid the virus requires to replicate.

How it helps:

- Essential for collagen and connective tissue synthesis
- Supports calcium absorption and bone health
- Powerful antiviral properties — particularly against herpes simplex (cold sores, HSV-1 and HSV-2)
- Supports healthy immune function
- Promotes carnitine synthesis — supports fat metabolism and energy
- Supports healthy hormone and enzyme production
- May support anxiety reduction
- Supports wound healing and tissue repair

Signs of deficiency:

- Frequent cold sores or herpes outbreaks
- Poor wound healing
- Fatigue and weakness
- Poor appetite and nausea
- Brittle bones and poor calcium absorption
- Hair loss
- Irritability and poor concentration
- Impaired immune function

L-Lysine- Rich Foods:

- Meat (beef, chicken, pork, lamb)
- Fish (cod, sardines, tuna)
- Eggs
- Dairy products
- Legumes (especially soybeans)
- Spirulina
- Fenugreek seed
- Quinoa
- Pumpkin seeds
- Parmesan cheese

Optimal Dosages:

- General health: 1,000–3,000 mg daily
- Cold sore prevention and antiviral support: 1,000–3,000 mg daily (maintenance); 3,000–9,000 mg daily in divided doses during active outbreak
- Bone health support: 1,000–2,000 mg daily alongside calcium and vitamin D
- Best taken on an empty stomach for antiviral use
- Maintain a high lysine to arginine ratio in the diet when managing herpes—reduce arginine-rich foods (nuts, chocolate, seeds) during outbreaks
- Pairs well with vitamin C for collagen synthesis support



NAC (N-ACETYL CYSTEINE)

NAC is a supplemental form of the amino acid cysteine and one of the most clinically researched and versatile supplements available. It is the direct precursor to glutathione—the body's master antioxidant—making it foundational for detoxification and oxidative stress defense. NAC has been used medically for decades as an antidote to acetaminophen (Tylenol) overdose and as a mucolytic agent, but its broader applications in mental health, respiratory function, immune support, and liver protection are equally compelling.

How it helps:

- Direct precursor to glutathione – the master antioxidant
- Supports liver detoxification and protection
- Breaks down and thins mucus – supports respiratory health
- Supports mental health – researched in OCD, addiction, and depression
- Powerful antioxidant and anti-inflammatory
- Supports kidney protection during oxidative stress
- May reduce insulin resistance
- Supports healthy immune function
- Protects against heavy metal toxicity

Signs of deficiency:

- Low glutathione levels
- Poor detoxification capacity
- Frequent respiratory infections or chronic congestion
- Liver stress or impaired liver function
- Oxidative stress and high inflammation
- Poor mental health resilience
- Impaired immune response
- Chemical and environmental sensitivities

NAC-Rich Foods:

- NAC itself is not found in food—it is a modified form of cysteine
- Cysteine-rich foods (precursor): chicken, turkey, eggs, sunflower seeds, legumes, dairy, broccoli, garlic, onions

Optimal Dosages:

- General health and antioxidant support: 600–900 mg daily
- Liver support and detoxification: 1,200–1,800 mg daily in divided doses
- Respiratory health: 600 mg twice daily
- Mental health support (OCD, addiction, mood): 1,200–2,400 mg daily
- Best taken on an empty stomach or with a light meal
- Always pair with glycine to maximize glutathione synthesis (glycine is the rate-limiting cofactor)
- Pair with vitamin C to help recycle and extend glutathione activity
- Those on nitroglycerin or activated charcoal should consult a practitioner



TAURINE

Taurine is a sulfur-containing amino acid—technically an amino sulfonic acid—that is one of the most abundant compounds in the brain, heart, eyes, and muscles. Unlike most amino acids, it is not used to build proteins but rather serves critical roles in cellular regulation, bile acid conjugation, antioxidant defense, and electrolyte balance. Once considered non-essential, emerging research—including landmark longevity studies—suggests taurine levels decline significantly with age and that supplementation may be one of the most impactful interventions for healthy aging.

How it helps:

- Supports heart health and healthy heart rhythm
- Protects and supports eye health (retinal health)
- Supports healthy brain function and may reduce anxiety
- Essential for bile acid conjugation and fat digestion
- Supports healthy electrolyte balance inside cells
- Powerful antioxidant – protects mitochondria
- Supports athletic performance and reduces muscle fatigue
- Emerging longevity research – declining taurine linked to aging
- Supports liver health and detoxification

Signs of deficiency:

- Heart problems and poor cardiovascular function
- Poor eye health and vision decline
- Anxiety and poor stress resilience
- Poor fat digestion and bile issues
- Muscle weakness and poor recovery
- Fatigue and low energy
- Impaired liver function
- Electrolyte imbalances

Taurine-Rich Foods:

- Scallops and clams
- Tuna and salmon
- Octopus
- Turkey and chicken (dark meat)
- Beef
- Lamb
- Eggs (small amounts)
- Dairy products (small amounts)
- Seaweed (small amounts)

Optimal Dosages:

- General health and longevity: 1,000–2,000 mg daily
- Cardiovascular and eye support: 1,500–3,000 mg daily
- Athletic performance: 1,000–2,000 mg pre-exercise
- Anxiety and neurological support: 1,000–3,000 mg daily
- Taurine is exceptionally safe—studies have used up to 6,000 mg daily with no adverse effects
- Can be taken with or without food
- Naturally declines with age—supplementation becomes increasingly important after 40
- Vegans and vegetarians are at higher risk of deficiency, as taurine is found almost exclusively in animal foods



L-CARNITINE

L-Carnitine is a naturally occurring compound synthesized from the amino acids lysine and methionine, and is essential for transporting long-chain fatty acids into the mitochondria where they are burned for energy. It plays a critical role in energy metabolism, cardiovascular function, brain health, and reproductive health. Carnitine levels decline significantly with age, and deficiency is particularly common in vegans, vegetarians, and older adults.

How it helps:

- Transports fatty acids into mitochondria for energy production
- Supports fat metabolism and healthy body composition
- Promotes cardiovascular health and heart muscle function
- Supports brain health and cognitive function
- Supports male fertility and sperm motility
- Reduces exercise-induced muscle damage and supports recovery
- Supports healthy blood sugar regulation
- May slow cognitive decline associated with aging

Signs of deficiency:

- Fatigue and low energy
- Difficulty losing weight despite diet and exercise
- Muscle weakness and poor recovery
- Brain fog and poor concentration
- Heart irregularities
- Poor sperm motility and male infertility
- Cold intolerance
- Mood disturbances

L-Carnitine-Rich Foods:

- Beef (richest source)
- Lamb
- Pork
- Chicken
- Fish
- Dairy products
- Asparagus (small amounts)
- Avocado (small amounts)
- Whole wheat bread (small amounts)

Optimal Dosages:

- General health and energy: 500–1,000 mg daily
- Fat metabolism and body composition: 1,000–2,000 mg daily
- Cardiovascular support: 1,000–3,000 mg daily
- Cognitive and aging support: 1,500–2,000 mg as acetyl-L-carnitine (ALCAR) –the form that crosses the blood-brain barrier
- Male fertility: 1,000–3,000 mg daily
- Best taken before meals or before exercise
- Acetyl-L-carnitine (ALCAR) preferred for brain and neurological benefits; L-carnitine tartrate is preferred for athletic performance
- Vegans and vegetarians should supplement routinely, as carnitine is found almost exclusively in animal foods

L-TYROSINE

L-tyrosine is a non-essential amino acid that serves as the direct precursor to some of the body's most important neurotransmitters and hormones, including dopamine, norepinephrine, epinephrine, and thyroid hormones T3 and T4. It is the foundation of the catecholamine pathway, making it essential for mood, motivation, focus, stress response, and metabolic function. Under conditions of chronic stress, illness, or intense cognitive demand, tyrosine becomes conditionally essential as the body's ability to synthesize sufficient amounts is overwhelmed.

How it helps:

- Precursor to dopamine – supports motivation, pleasure, and focus
- Precursor to norepinephrine and epinephrine – supports stress response
- Essential for thyroid hormone production (T3 and T4)
- Supports mental performance under stress and sleep deprivation
- Promotes healthy mood and emotional resilience
- Supports healthy metabolism via thyroid support
- May support ADHD and attention-related challenges
- Supports melanin production (skin and hair pigment)

Signs of deficiency:

- Depression and low motivation
- Brain fog and poor concentration
- Fatigue and low energy
- Underactive thyroid symptoms
- Poor stress resilience
- Low libido
- Difficulty with focus and attention
- Premature greying of hair

L-Tyrosine- Rich Foods:

- Chicken and turkey
- Beef and pork
- Fish and seafood
- Eggs
- Dairy products (especially parmesan)
- Soy products
- Pumpkin seeds
- Peanuts
- Almonds
- Avocado

Optimal Dosages:

- General health and mood support: 500–1,000 mg daily
- Cognitive performance and stress resilience: 1,000–2,000 mg daily
- Thyroid support: 500–1,500 mg daily alongside iodine and selenium
- Best taken on an empty stomach 30–60 minutes before mentally demanding tasks or stressful situations
- Use N-acetyl-L-tyrosine (NALT) for enhanced bioavailability
- Avoid taking alongside thyroid medications without practitioner guidance
- Those with melanoma, hyperthyroidism, or taking MAOIs should consult a practitioner before supplementing



L-TRYPTOPHAN

L-tryptophan is an essential amino acid and the sole dietary precursor to serotonin, the neurotransmitter most associated with mood, emotional well-being, and social behavior. It is also the precursor to melatonin, making it foundational for both sleep and circadian rhythm regulation. Despite its critical importance, tryptophan competes with other large neutral amino acids for transport across the blood-brain barrier, meaning dietary intake alone does not guarantee adequate brain levels.

How it helps:

- Sole precursor to serotonin – supports mood and emotional wellbeing
- Precursor to melatonin – supports healthy sleep and circadian rhythm
- Supports anxiety reduction and stress resilience
- Promotes healthy appetite regulation
- Supports cognitive function and memory
- May reduce symptoms of depression and seasonal affective disorder
- Supports healthy pain tolerance
- Promotes healthy immune function via NAD⁺ pathway

Signs of deficiency:

- Depression and low mood
- Anxiety and irritability
- Poor sleep and insomnia
- Increased pain sensitivity
- Carbohydrate cravings
- Poor concentration and memory
- Seasonal mood changes
- Aggressive behavior and poor impulse control

L-Tryptophan-Rich Foods:

- Turkey
- Chicken
- Eggs
- Cheese (especially cheddar and parmesan)
- Pumpkin seeds
- Tofu and soy products
- Salmon and tuna
- Milk and dairy
- Peanuts
- Oats

Optimal Dosages:

- General mood and well-being: 500–1,000 mg daily
- Sleep support: 1,000–2,000 mg taken 30–60 minutes before bed
- Depression and anxiety support: 2,000–4,000 mg daily in divided doses
- Consider 5-HTP (a direct tryptophan metabolite) as an alternative—it more readily converts to serotonin and requires lower doses (100–300 mg)
- Do not combine with SSRIs, SNRIs, or MAOIs without practitioner supervision due to risk of serotonin syndrome
- Take on an empty stomach or with a small carbohydrate snack—carbohydrates enhance tryptophan transport to the brain
- Best taken separately from high-protein meals which compete for absorption



GABA (GAMMA-AMINOBUTYRIC ACID)

GABA is the brain's primary inhibitory neurotransmitter, working by slowing down neuronal activity, promoting calm, reducing anxiety, and facilitating sleep. While technically an amino acid derivative rather than a protein-building amino acid, it is closely related and functionally essential. Low GABA activity is strongly associated with anxiety disorders, insomnia, epilepsy, and chronic stress. Many commonly used medications, including benzodiazepines and alcohol, work by enhancing GABA signaling—making natural GABA support relevant for those seeking to reduce reliance on these substances.

How it helps:

- Primary inhibitory neurotransmitter – promotes calm and relaxation
- Supports healthy sleep onset and sleep quality
- Reduces anxiety and nervous system hyperactivity
- Supports healthy stress response
- May reduce blood pressure
- Supports healthy growth hormone secretion
- May reduce symptoms of PMS and menopause
- Supports healthy pain regulation

Signs of deficiency:

- Anxiety and racing thoughts
- Insomnia and poor sleep quality
- Chronic stress and inability to relax
- Irritability and mood instability
- Muscle tension
- Seizure susceptibility
- Cravings for alcohol, carbohydrates, or sedatives
- Overwhelm and sensory sensitivity

GABA-Rich Foods:

- Fermented foods (kimchi, miso, tempeh, kefir)
- Sprouted grains and legumes
- Tomatoes
- Spinach and leafy greens
- Mushrooms
- Broccoli
- Sweet potato
- Lentils
- Chestnuts
- Green and black tea

Optimal Dosages:

- General calm and stress support: 250–500 mg daily
- Sleep support: 500–750 mg taken 30–60 minutes before bed
- Anxiety support: 500–1,000 mg daily in divided doses
- Pharma GABA (naturally fermented form) is considered more effective than synthetic GABA at crossing the blood-brain barrier
- L-theanine works synergistically with GABA—combining them enhances the calming effect
- Magnesium glycinate also supports GABA signaling and pairs well
- Those tapering from benzodiazepines or alcohol should work with a practitioner

5-HTP (5-HYDROXYTRYPTOPHAN)

5-HTP is a naturally occurring amino acid and the direct metabolic precursor to serotonin, sitting one step closer to serotonin than L-tryptophan in the biosynthetic pathway. It is derived from the seeds of the African plant *Griffonia simplicifolia* and crosses the blood-brain barrier efficiently, making it one of the most direct and effective natural tools for supporting serotonin levels. Unlike tryptophan, 5-HTP does not compete with other amino acids for brain transport, giving it a more reliable and predictable effect on mood, sleep, and appetite regulation.

How it helps:

- Direct precursor to serotonin – supports mood, emotional wellbeing, and calm
- Supports healthy sleep – serotonin converts to melatonin
- Reduces anxiety and promotes relaxation
- Supports healthy appetite regulation and reduces carbohydrate cravings
- May reduce frequency and severity of migraines and tension headaches
- Supports healthy pain tolerance via serotonin pathways
- May reduce symptoms of fibromyalgia
- Supports healthy weight management via appetite suppression
- Promotes emotional resilience and stress tolerance

Signs of deficiency:

- Depression and persistently low mood
- Anxiety and excessive worry
- Poor sleep and insomnia
- Carbohydrate and sugar cravings
- Increased pain sensitivity
- Emotional volatility and poor stress resilience
- Compulsive or addictive behaviours
- Migraines and tension headaches
- Poor appetite regulation

5-HTP-Rich Foods:

- 5-HTP is not found directly in food
- Foods rich in tryptophan (the precursor to 5-HTP): turkey, chicken, eggs, pumpkin seeds, dairy products, tofu, salmon, oats, bananas

Optimal Dosages:

- General mood and well-being: 50–100 mg daily
- Sleep support: 100–200 mg taken 30–60 minutes before bed
- Depression and anxiety support: 100–300 mg daily in divided doses
- Appetite and weight management: 50–100 mg before meals
- Always start at the lowest dose (50 mg) and increase gradually
- Always take with vitamin B6 (P5P)—an essential cofactor for converting 5-HTP to serotonin
- Never combine with SSRIs, SNRIs, MAOIs, or St John's Wort without practitioner supervision—serious risk of serotonin syndrome
- Avoid taking with protein-rich meals—amino acids compete for brain transport
- Do not use continuously long term without breaks—consider cycling with L-tryptophan
- Those with carcinoid syndrome or eosinophilia-myalgia syndrome should avoid



L-PROLINE

L-proline is a non-essential amino acid and one of the most critical building blocks of collagen—the most abundant protein in the human body. Together with glycine, proline constitutes the majority of collagen's amino acid structure, making it indispensable for the integrity of skin, joints, tendons, ligaments, blood vessels, and the gut lining. While the body can synthesize proline, production often falls short of optimal—particularly under conditions of aging, chronic stress, or high physical demand.

How it helps:

- Essential building block of collagen alongside glycine
- Supports skin elasticity and healthy aging
- Promotes joint, tendon, and ligament health
- Supports gut lining integrity and repair
- Supports cardiovascular health — maintains arterial wall integrity
- Promotes wound healing and tissue repair
- Supports healthy immune function
- May support healthy blood pressure via arterial health

Signs of deficiency:

- Poor skin elasticity and premature aging
- Joint pain and poor connective tissue integrity
- Slow wound healing
- Digestive issues and leaky gut
- Cardiovascular weakness
- Muscle and tendon injuries
- Poor recovery from exercise or injury

L-Proline-Rich Foods:

- Bone broth
- Collagen peptides
- Beef and pork (especially tough cuts)
- Chicken skin
- Gelatin
- Egg whites
- Dairy products
- Asparagus
- Mushrooms
- Cabbage

Optimal Dosages:

- General health and skin support: 500–1,000 mg daily
- Collagen and connective tissue support: 1,000–2,000 mg daily
- Best taken alongside vitamin C—essential for converting proline to hydroxyproline, the stabilized form used in collagen
- Found abundantly in collagen peptides and bone broth—dietary sources are an excellent and practical way to supplement
- Pairs powerfully with glycine—take together for maximum collagen synthesis support
- Works best as part of a broader collagen support protocol including vitamin C, silica, and zinc

L-METHIONINE

L-methionine is an essential sulfur-containing amino acid that serves as the starting point for numerous critical biochemical pathways. It is the precursor to S-adenosylmethionine (S-AdoMet) –the body's universal methyl donor–making it foundational for methylation, which affects gene expression, neurotransmitter production, detoxification, and inflammation regulation. Methionine is also the precursor to cysteine, taurine, and ultimately glutathione, placing it at the head of the entire sulfur amino acid pathway.

How it helps:

- Precursor to S-AdoMet – supports methylation throughout the body
- Supports liver health and detoxification
- Essential for glutathione production via the transsulfuration pathway
- Promotes healthy mood – S-AdoMet is well researched for depression
- Supports joint health – S-AdoMet supports cartilage synthesis
- Supports healthy DNA methylation and gene expression
- Promotes healthy skin, hair, and nail growth
- Supports cardiovascular health via homocysteine regulation

Signs of deficiency:

- Fatty liver and impaired liver detoxification
- Depression and poor mood
- Brittle hair and nails
- Muscle weakness and fatigue
- Poor wound healing
- Elevated homocysteine (cardiovascular risk)
- Impaired detoxification
- Joint degeneration

L-Methionine-Rich Foods:

- Beef and lamb
- Chicken and turkey
- Pork
- Fish (tuna, salmon, sardines)
- Eggs
- Dairy products
- Brazil nuts
- Sesame seeds
- Spirulina
- Tofu

Optimal Dosages:

- General health: 500–1,000 mg daily from dietary sources is usually sufficient
- Liver and detox support: 1,000–2,000 mg daily
- Mood support: Consider S-AdoMet directly at 400–1,600 mg daily as a more targeted approach
- Important: High methionine intake raises homocysteine—always ensure adequate B6, B12, and folate when supplementing to support healthy homocysteine metabolism
- Those with homocystinuria or bipolar disorder should consult a practitioner before supplementing
- Balance methionine with glycine—a high methionine-to-glycine ratio is associated with increased inflammatory and aging markers

INOSITOL

Inositol is a naturally occurring sugar alcohol that functions as a critical component of cell membrane phospholipids and serves as a secondary messenger in numerous hormonal and neurotransmitter signaling pathways. Once classified as vitamin B8, it is now understood that the body can synthesize it, though often not in sufficient amounts under conditions of metabolic stress, hormonal imbalance, or mental health challenges. Inositol has emerged as one of the most exciting and clinically validated natural compounds for PCOS, anxiety, OCD, and metabolic health—with a particularly impressive body of research in female hormonal health.

How it helps:

- Supports healthy insulin signaling and glucose metabolism
- Clinically validated for PCOS – reduces testosterone, restores ovulation, and improves insulin sensitivity
- Supports healthy mood – particularly anxiety, OCD, and panic disorder
- Supports healthy serotonin and dopamine signaling
- Promotes healthy egg quality and fertility in women
- Supports healthy thyroid function
- Supports healthy liver fat metabolism – reduces non-alcoholic fatty liver disease
- Supports healthy hair growth in PCOS-related hair loss
- Supports healthy fetal neural tube development
- Promotes healthy sleep quality

Signs of deficiency:

- Anxiety, panic attacks, and OCD tendencies
- PCOS symptoms – irregular cycles, elevated androgens, cystic ovaries
- Poor insulin sensitivity and blood sugar dysregulation
- Difficulty conceiving
- Poor egg quality
- Fatty liver
- Depression and poor mood
- Hair thinning and loss (androgen-driven)
- Poor sleep quality

Inositol-Rich Foods:

- Citrus fruits (especially oranges and grapefruit)
- Cantaloupe
- Beans and legumes
- Brown rice and whole grains
- Corn
- Sesame seeds
- Wheat germ
- Nuts (especially almonds and peanuts)
- Fresh vegetables broadly
- Note: Therapeutic doses required for clinical benefit are difficult to achieve through food alone—supplementation is necessary

Optimal Dosages:

- General mood and anxiety support: 2–4 g daily of myo-inositol
- OCD and panic disorder: 12–18 g daily—the most researched therapeutic dose for these conditions
- PCOS and hormonal support: 4 g myo-inositol combined with 100 mg D-chiro-inositol daily—the 40:1 ratio is the most clinically validated combination
- Fertility and egg quality support: 4g myo-inositol daily—begin at least 3 months before conception attempts
- Metabolic and blood sugar support: 2–4 g daily with meals
- Inositol is exceptionally safe even at high doses—occasional mild nausea and digestive upset at doses above 12 g
- Powder form is most practical and cost effective at therapeutic doses
- Effects on PCOS and hormonal health are cumulative—allow 3–6 months for full benefit
- Pairs powerfully with folate, NAC, and omega-3 for comprehensive PCOS support

BRANCHED CHAIN AMINO ACIDS (BCAAS)

BCAAs—leucine, isoleucine, and valine—are a group of three essential amino acids named for their branched molecular structure. Unlike most amino acids, which are metabolized in the liver, BCAAs are metabolized directly in muscle tissue, making them uniquely important for muscle protein synthesis, energy during exercise, and recovery. Leucine in particular is the primary trigger for muscle protein synthesis, acting as a direct signal to the mTOR pathway. BCAAs are among the most researched sports nutrition supplements, but their benefits extend well beyond athletics into liver health, immune function, and metabolic support

How it helps:

- Stimulates muscle protein synthesis – particularly leucine via mTOR pathway
- Reduces exercise-induced muscle breakdown
- Supports faster recovery from intense exercise
- Provides direct energy source for muscle tissue during exercise
- Supports liver health – used therapeutically in liver cirrhosis
- May reduce mental fatigue during prolonged exercise
- Supports healthy immune function
- Supports healthy blood sugar regulation – isoleucine enhances glucose uptake

Signs of deficiency:

- Muscle loss and poor recovery
- Fatigue during exercise
- Poor athletic performance
- Muscle soreness and slow recovery
- Impaired liver function
- Poor wound healing
- Immune dysfunction
- Blood sugar instability

BCAAs-Rich Foods:

- Whey protein
- Beef and lamb
- Chicken and turkey
- Eggs
- Fish and seafood
- Dairy products (especially Greek yogurt)
- Soy protein
- Pumpkin seeds
- Quinoa
- Lentils

Optimal Dosages:

- General health and muscle maintenance: 5–10 g daily
- Athletic performance and recovery: 10–20 g daily—split around training
- The optimal leucine to isoleucine to valine ratio is 2:1:1
- Best taken before or during exercise for performance; after exercise for recovery
- Whole food protein sources containing BCAAs (whey, meat, eggs) are often superior to isolated BCAA supplements if total protein intake is adequate
- Whey protein is naturally rich in BCAAs and may be more cost effective than isolated BCAA supplements
- Older adults benefit significantly from higher BCAA intake to counteract age-related muscle loss (sarcopenia)

L-THEANINE

L-theanine is a naturally occurring amino acid found almost exclusively in tea leaves, particularly green tea, where it is responsible for the calm yet alert mental state associated with tea drinking. It works by increasing alpha brain wave activity—the same relaxed-focus state associated with meditation—and by modulating key neurotransmitters, including GABA, serotonin, and dopamine. Unlike sedatives or anxiolytics, L-theanine promotes relaxation without drowsiness, making it uniquely valuable for daytime calm and focused cognitive performance.

How it helps:

- Promotes calm relaxation without sedation or drowsiness
- Increases alpha brain wave activity – supports focused, meditative mental state
- Supports healthy GABA, serotonin, and dopamine levels
- Reduces anxiety and stress response
- Enhances cognitive performance and focus – especially combined with caffeine
- Supports healthy sleep quality and sleep onset
- May reduce blood pressure during stress
- Supports immune function via gut microbiome modulation
- Protects neurons from overstimulation and oxidative stress

Signs of deficiency:

- L-theanine is not an essential nutrient, so there is no classical deficiency state –however, low intake is associated with:
- Anxiety and chronic stress
- Poor sleep quality and racing thoughts at bedtime
- Difficulty focusing without stimulants
- Heightened stress response and irritability
- Caffeine sensitivity and jitteriness
- Poor stress resilience

L-Theanine-Rich Foods:

- Green tea (highest concentration)
- Black tea
- White tea
- Oolong tea
- Matcha (concentrated green tea powder—richest dietary source)
- Some mushroom varieties (small amounts)
- Bay bolete mushrooms
- Guayusa tea
- Gyokuro green tea (shade-grown is particularly high)

Optimal Dosages:

- General calm and focus: 100–200 mg daily
- Anxiety and stress support: 200–400 mg daily
- Sleep support: 200 mg taken 30–60 minutes before bed
- Cognitive performance—the caffeine + L-theanine stack (typically 100 mg caffeine : 200 mg theanine) is one of the most well-researched combinations for sustained focus without jitteriness
- Suntheanine is the most clinically studied patented form
- Exceptionally safe—no known toxicity or upper limit established
- Can be taken with or without food at any time of day



ANTIOXIDANTS & PLANT COMPOUNDS



ALPHA LIPOIC ACID (ALA)

Alpha lipoic acid is a naturally occurring compound that functions as both a fat-soluble and water-soluble antioxidant—a unique property that allows it to work in virtually every tissue and cell compartment in the body. It is often called the "universal antioxidant" for this reason. ALA plays a central role in mitochondrial energy metabolism and has the remarkable ability to regenerate other antioxidants, including vitamins C and E and glutathione, effectively amplifying the entire antioxidant network.

How it helps:

- Universal antioxidant—works in both fat- and water-soluble environments
- Regenerates and recycles vitamins C, E, and glutathione
- Supports mitochondrial energy production
- Supports healthy blood sugar and insulin sensitivity
- Protects nerves from oxidative damage—particularly valuable in diabetic neuropathy
- Supports liver detoxification and protection
- Supports healthy weight management
- May reduce inflammation and support cardiovascular health
- Supports healthy brain aging and cognitive function
- Chelates heavy metals—supports detoxification

Signs of Deficiency

- ALA is synthesized by the body in small amounts, but dietary and supplemental intake is often suboptimal. Low levels are associated with:
- Fatigue and poor energy production
- Poor blood sugar regulation
- Nerve pain or peripheral neuropathy
- Impaired detoxification
- Accelerated aging and oxidative stress
- Poor antioxidant recycling
- Cognitive decline

ALA-Rich Foods:

- Organ meats (liver, kidney, heart)
- Beef
- Spinach
- Broccoli
- Brussels sprouts
- Tomatoes
- Peas
- Beets
- Carrots
- Rice bran

Optimal Dosages

- General antioxidant and health support: 300–600 mg daily
- Blood sugar and insulin support: 600–1,200 mg daily
- Neuropathy and nerve support: 600–1,800 mg daily
- Heavy metal detox support: 300–600 mg daily
- Always choose R-ALA (R-alpha lipoic acid)—the natural form; S-ALA is synthetic and significantly less bioavailable
- Na-RALA (sodium R-ALA) is the most stable and bioavailable form available
- Take on an empty stomach for best absorption
- May lower blood sugar—those on diabetes medications should monitor carefully

ASTAXANTHIN

Astaxanthin is a naturally occurring carotenoid pigment produced by microalgae, giving salmon, shrimp, and flamingos their distinctive pink-red color. It is widely considered the most potent antioxidant found in nature – estimated to be up to 6,000 times more powerful than vitamin C, 800 times more powerful than CoQ10, and 550 times more powerful than vitamin E in certain antioxidant measurements. Unlike many antioxidants, astaxanthin never becomes a pro-oxidant in the body, making it exceptionally safe at high doses.

How it helps:

- Most potent naturally occurring antioxidant known
- Protects skin from UV damage and supports healthy aging
- Supports eye health – crosses the blood-retinal barrier
- Supports brain health – crosses the blood-brain barrier
- Reduces exercise-induced oxidative stress and muscle damage
- Supports cardiovascular health and healthy cholesterol levels
- Supports healthy immune function
- Reduces systemic inflammation
- Supports joint health and reduces exercise-related pain
- Supports male fertility and sperm quality

Signs of Deficiency

- Astaxanthin is not an essential nutrient but low intake is associated with:
- Accelerated skin aging and UV sensitivity
- Poor eye health and visual fatigue
- Elevated oxidative stress and inflammation
- Poor exercise recovery
- Cognitive decline
- Poor cardiovascular health markers
- Weakened immune response

Astaxanthin-Rich Foods:

- Wild caught salmon (especially sockeye)
- Shrimp and prawns
- Lobster
- Crab
- Trout
- Microalgae (*Haematococcus pluvialis*)
- Red snapper
- Sea bream
- Krill
- Crawfish

Optimal Dosages:

- General health and antioxidant support: 4–8 mg daily
- Athletic performance and recovery: 8–12 mg daily
- Eye, brain, and skin support: 8–12 mg daily
- Anti-aging and longevity: 8–12 mg daily
- Always take with a fat-containing meal—astaxanthin is fat-soluble
- Natural astaxanthin from *Haematococcus pluvialis* microalgae is strongly preferred over synthetic astaxanthin
- Effects are cumulative—allow 4–8 weeks for full benefits to develop
- One of the few antioxidants with no established upper safety limit—extremely well tolerated



BERBERINE

Berberine is a natural compound found in several plants, including barberry, goldenseal, and Oregon grape.

How it helps:

- Helps regulate blood sugar
- Lower cholesterol levels
- Supports healthy immune system
- Used in diarrhea, infections, and other digestive issues as it can act as a "natural" antibiotic

Contraindications:

- Berberine may lower blood sugar levels and can interact with medications used to treat diabetes, so it's important to monitor blood sugar levels closely.
- Berberine may interfere with the metabolism and effectiveness of some medications, such as statins, antibiotics, and blood pressure drugs.
- Berberine may interact with liver enzymes and may be contraindicated in people with liver disease or dysfunction.

Optimal Dosage:

- General metabolic health: 500 mg twice daily with meals
- Blood sugar and insulin support: 500 mg three times daily with meals
- Cholesterol and cardiovascular support: 500–1,500 mg daily in divided doses
- Gut microbiome support: 500 mg twice daily
- Berberine HCl is the most commonly studied form
- Dihydroberberine (DHB) is a newer form with significantly enhanced bioavailability—effective at roughly half the dose
- Always take with meals—berberine can cause nausea on an empty stomach
- May interact with medications metabolized by CYP3A4—consult a practitioner if on prescription medications
- Often compared to Metformin in its blood sugar lowering effects—those on diabetes medications should monitor carefully
- Cycle berberine—8 weeks on, 2–4 weeks off—to prevent tolerance and maintain gut microbiome diversity

COENZYME Q10 (COQ10)

Coenzyme Q10 is a fat-soluble, vitamin-like compound found in virtually every cell in the body, with the highest concentrations in the heart, liver, kidneys, and muscles—the organs with the greatest energy demands. It plays an indispensable role in the mitochondrial electron transport chain, where it facilitates the production of ATP—the body's primary energy currency. CoQ10 also functions as a powerful antioxidant, protecting cell membranes and mitochondria from oxidative damage. Critically, CoQ10 production declines significantly with age and is severely depleted by statin medications.

How it helps:

- Essential for mitochondrial ATP energy production
- Powerful antioxidant—protects mitochondria and cell membranes
- Supports heart health and cardiovascular function
- Supports healthy blood pressure
- Reduces statin-induced muscle pain and fatigue
- Supports brain health and cognitive function
- Supports healthy fertility in both men and women
- Promotes healthy skin aging
- Supports healthy blood sugar regulation
- Supports immune function

Signs of Deficiency:

- Fatigue and low energy, particularly in those on statins
- Muscle pain, weakness, and cramping
- Brain fog and poor cognitive function
- Heart irregularities and poor cardiovascular function
- High blood pressure
- Poor exercise tolerance
- Accelerated skin aging
- Gum disease and poor oral health
- Infertility

CoQ10-Rich Foods:

- Organ meats (heart, liver, kidney)
- Beef and pork
- Sardines and mackerel
- Chicken
- Rainbow trout
- Spinach
- Cauliflower
- Broccoli
- Sesame seeds
- Pistachios

Optimal Dosages:

- General health and antioxidant support: 100–200 mg daily
- Cardiovascular support: 200–400 mg daily
- Statin users—essential: 200–600 mg daily
- Mitochondrial and energy support: 300–600 mg daily
- Fertility support: 200–600 mg daily
- Always choose ubiquinol over ubiquinone—the active, reduced form with significantly superior bioavailability, especially in those over 40
- Take with a fat-containing meal for optimal absorption
- Those on warfarin should consult a practitioner, as CoQ10 may affect INR levels
- Benefits are cumulative—allow 4–8 weeks for full effect

CURCUMIN/TURMERIC

Curcumin is the primary active polyphenol in turmeric, the golden spice that has been central to Ayurvedic and traditional Chinese medicine for thousands of years. It is one of the most extensively researched natural compounds in the world, with thousands of published studies examining its anti-inflammatory, antioxidant, and neuroprotective properties. However, curcumin in its raw form is notoriously poorly absorbed—making the form of supplementation critically important for therapeutic benefit.

How it helps:

- Potent anti-inflammatory – inhibits NF-kB, one of the most important inflammatory pathways
- Powerful antioxidant – directly neutralizes free radicals and boosts the body's own antioxidant enzymes
- Supports brain health – increases BDNF (brain-derived neurotrophic factor)
- Supports joint health and reduces arthritis symptoms
- Supports liver health and detoxification
- Supports cardiovascular health and healthy cholesterol
- Supports healthy blood sugar regulation
- May support mood and reduce depression
- Supports healthy gut microbiome
- Emerging research in cancer prevention and neuroprotection

Signs of Deficiency

- Curcumin is not an essential nutrient but low intake is associated with:
- Chronic inflammation and elevated inflammatory markers
- Joint pain and stiffness
- Poor cognitive function and mood
- Elevated blood sugar and metabolic dysfunction
- Poor liver function
- Digestive issues and gut dysbiosis

Turmeric-Rich Foods:

- Turmeric root (fresh or dried)
- Curry powder
- Golden milk
- Mustard
- Mango ginger
- Turmeric tea
- Pickles (turmeric-brined)
- Butter chicken and other curry dishes
- Turmeric rice
- Scrambled eggs with turmeric

Optimal Dosages

- General anti-inflammatory support: 500–1,000 mg daily of curcumin extract
- Therapeutic/joint and brain support: 1,000–2,000 mg daily
- Bioavailability is the critical issue—always choose enhanced absorption forms:
- Meriva (phospholipid complex)—29x more bioavailable
- BCM-95 (combined with essential oils)—6x more bioavailable
- Theracurmin (colloidal dispersion)—highly bioavailable
- Longvida (lipid nanoparticles)—excellent brain penetration
- Adding black pepper (piperine) increases absorption by up to 2,000%—most basic enhanced formulas use this
- Take with a fat-containing meal
- May interact with blood thinners at high doses—consult a practitioner



HONEYSUCKLE

Honeysuckle is a flowering plant that has been used in traditional medicine for its various health benefits

How it helps:

- Anti-Inflammatory
- Anti-Viral
- Anti-Bacterial
- Helps with colds, coughs, fever and respiratory infections

Honeysuckle Tea:

To make a honeysuckle tea, simply add 1-2 teaspoons of dried honeysuckle flowers to a cup of hot water and let it steep for 5-10 minutes. You can also add other herbs like peppermint or ginger for added flavor and benefits

Optimal Dosages:

- General immune and antiviral support: 500–1,500 mg daily of dried extract
- Acute infection support: 1,500–3,000 mg daily in divided doses
- Anti-inflammatory support: 500–1,000 mg daily
- Commonly consumed as tea in traditional Chinese medicine—1–3 cups daily of honeysuckle flower tea is a practical and effective approach
- Look for standardized extracts of *Lonicera japonica*—the most studied species
- Generally very well tolerated—mild digestive upset occasionally reported at higher doses
- Pairs well with elderberry and quercetin for broad-spectrum immune support



DANDELION

(*Taraxacum officinale*). The root, flower, and leaves of dandelion contain an array of phytochemicals.

How they help:

- Anti-inflammatory
- Antioxidant
- Hypolipidemic—lowers concentrations of lipoproteins
- Antimicrobial
- Anticoagulant properties

Contraindications:

- Note that dandelion extract is considered contraindicated in those with liver and biliary disease, bile duct obstruction, gallstones, cholangitis, and active peptic ulcers.
- Furthermore, dandelion is rich in potassium and should be used cautiously in patients with kidney failure.

Optimal Dosages:

- General liver and digestive support: 500–1,500 mg daily of dried root extract
- Diuretic and kidney support: 500–2,000 mg daily—dandelion leaf is preferred for this application
- Antioxidant and anti-inflammatory support: 500–1,000 mg daily
- Dandelion root is preferred for liver and digestive support
- Dandelion leaf is preferred for diuretic, kidney, and nutritional support
- Can also be consumed as tea—1–2 cups of dandelion root or leaf tea daily is a practical and effective approach
- Dandelion is a natural diuretic—ensure adequate hydration when supplementing
- Those on diuretics, lithium, or diabetes medications should consult a practitioner
- Generally very well tolerated—one of the safest herbal supplements available



ELDERBERRY

Elderberry is a type of dark purple berry that grows on the elder tree, scientifically known as *Sambucus nigra*. Elderberries have been used for centuries in traditional medicine to help treat various illnesses and promote overall health.

How it helps:

- Help boost the immune system
- Fights respiratory infections
- reduce inflammation
- Rich in antioxidants
- Antiviral and antibacterial properties
- Aids in blood sugar balance
- Good for digestive health

Method to make tincture:

- Combine 1 cup dried elderberries and 4 cups of water in a large pot and bring to a boil.
- Reduce heat and simmer for 30 minutes.
- Strain the mixture through a fine mesh strainer or cheesecloth into a glass jar.
- Add 1 cup of honey and 1 cup of vodka to the jar and stir well.
- Allow the mixture to cool to room temperature, then cover with a tight-fitting lid and store in a cool, dark place for 4-6 weeks, shaking daily.
- Transfer the liquid to a dropper bottle and store in a cool, dark place.
- To use, add a few drops of the elderberry tincture to a cup of hot water and enjoy as a tea or add to smoothies, juices, or other beverages for added health benefits.

Contraindications:

- While elderberry is generally considered safe for most people, there are some potential side effects and interactions to be aware of.
- Raw or unripe elderberries contain a toxic compound called cyanogenic glycoside, which can cause nausea, vomiting, and diarrhea.
- It is important to cook or otherwise properly prepare elderberries before consuming them.

Optimal Dosages:

- General immune maintenance: 500–1,000 mg daily of standardized extract
- Acute illness—cold and flu: 1,000–4,000 mg daily in divided doses for up to 5 days
- Sambucol and *Sambucus nigra* standardized extracts are the most clinically researched forms
- Elderberry syrup: 1 tablespoon (15 ml) daily for maintenance; 1 tablespoon 4 times daily during illness
- Do not use raw or unripe elderberries—they contain compounds that can cause nausea and vomiting
- Generally considered safe for short-term use—long-term safety data beyond 12 weeks is limited
- Those with autoimmune conditions should consult a practitioner, as elderberry actively stimulates immune function

MILK THISTLE (SILYMARIN)

Milk thistle is a flowering herb whose active compound – a flavonoid complex called silymarin – is one of the most extensively researched natural hepatoprotective (liver-protecting) agents in the world. Silymarin works through multiple mechanisms to protect liver cells from damage, promote regeneration of liver tissue, and enhance the liver's detoxification capacity. It has been used medicinally for over 2,000 years and remains one of the most clinically validated herbal supplements available.

How it helps:

- Protects liver cells from toxin, alcohol, and drug-induced damage
- Promotes liver cell regeneration and repair
- Supports healthy bile production and flow
- Powerful antioxidant—particularly in liver tissue
- Supports phase I and phase II liver detoxification
- May reduce liver inflammation and fibrosis
- Supports healthy cholesterol levels
- Supports healthy blood sugar regulation
- May protect kidneys from toxin-induced damage
- Supports healthy inflammatory response

Signs of Deficiency:

- Milk thistle is not an essential nutrient but low intake alongside liver stress is associated with:
- Impaired liver detoxification
- Elevated liver enzymes
- Poor fat digestion and bile flow
- Toxic burden and chemical sensitivities
- Elevated cholesterol
- Fatigue and hormonal imbalances linked to poor liver clearance
- Skin issues driven by impaired detoxification

Milk Thistle-Rich Foods:

- Milk thistle seeds (can be ground and added to food)
- Milk thistle tea
- Artichokes (contain related flavonoids)
- Note: meaningful silymarin levels are difficult to achieve through food alone—supplementation is strongly recommended for therapeutic benefit

Optimal Dosages:

- General liver support and maintenance: 200–400 mg daily of standardized silymarin extract
- Therapeutic liver support: 400–800 mg daily in divided doses
- Detox protocol support: 400–600 mg daily
- Look for extracts standardized to 70–80% silymarin content
- Silybin phytosome (bound to phosphatidylcholine) offers significantly enhanced bioavailability over standard silymarin
- Take with meals for best absorption
- One of the safest supplements available—well tolerated even at high doses
- Those on medications metabolized by the liver should consult a practitioner, as milk thistle may affect drug metabolism



NIGELLA SATIVA

Nigella sativa is a small shrub native to Southern Europe, North Africa, and Southeast Asia. It is a widely used medical plant in different cultures all over the world and is also called: Black Cumin Seed, Black Seed, Kalonji, Roman Coriander, Black Caraway, and Fennel Flower.

How it helps:

- Diuretic
- Antihypertensive
- Antidiabetic
- Anticancer
- Immunomodulatory
- Analgesic
- Antimicrobial
- Anthelmintics
- Bronchodilator
- Gastroprotective
- Hepatoprotective
- Renal protective
- Antioxidant

Active compound:

Most of the therapeutic properties of this plant are due to the presence of thymoquinone (TQ) which is a major active chemical component of the essential oil.

- Comes in seeds, oil, and supplements
- When buying oil, purchase 100% cold-pressed oil

Optimal Dosages:

- General health and immune support: 1–2 teaspoons (5–10 ml) of black seed oil daily
- Anti-inflammatory and allergy support: 2–3 teaspoons daily
- Blood sugar support: 1–2 teaspoons daily with meals
- Capsule form: 500–2,000 mg daily of standardized extract
- Look for oil cold-pressed from *Nigella sativa* seeds with a minimum 3% thymoquinone content—thymoquinone is the primary active compound
- Black seed oil has a strong, bitter, peppery taste—mixing it with honey or adding it to smoothies improves palatability
- Take with food to reduce digestive sensitivity
- Pregnant women should avoid therapeutic doses as it may stimulate uterine contractions



QUERCETIN

Quercetin is a plant phytochemical (flavonoid) with broad-spectrum anti-inflammatory, antioxidant, antiviral, anticoagulant, and immune-modulatory properties. Citrus fruits, apples, berries, onions, parsley, sage, tea, and red wine are foods containing quercetin.

How it helps:

- Inhibits SARS-COV-2 replication by several mechanisms.
- Heart health
- Inhibits mast cells.
- Reduces neuroinflammation.
- Anti-inflammatory properties
- Allergies
- Exercise performance and recovery

Contraindications:

- Due to the possible drug interaction between quercetin and ivermectin, these drugs should not be taken simultaneously.
- The use of quercetin has rarely been associated with hypothyroidism. The clinical impact of this association may be limited to those individuals with pre-existent thyroid disease or those with subclinical hypothyroidism.
- Quercetin should be used with caution in patients with hypothyroidism, and TSH levels should be monitored.
- The safety of quercetin and flavonoids in pregnancy has not been established, and they should probably be avoided.

Optimal Dosages:

- General antioxidant and anti-inflammatory support: 500–1,000 mg daily
- Immune and antiviral support: 500–1,000 mg twice daily
- Allergy and histamine support: 500–1,000 mg daily—most effective when taken before allergen exposure
- Always choose quercetin phytosome (complexed with sunflower phospholipids) for significantly enhanced bioavailability—standard quercetin is poorly absorbed
- Quercetin with bromelain is a popular combination that enhances absorption and amplifies anti-inflammatory effects
- Pairs powerfully with zinc and quercetin and acts as a zinc ionophore, driving zinc into cells where it can inhibit viral replication
- Pairs well with vitamin C for synergistic antioxidant and immune effects
- Take with a fat-containing meal for best absorption
- Generally very well tolerated—one of the safest plant compounds available



OMEGA-3

Omega-3's are a type of polyunsaturated fatty acid (PUFA) essential for many functions in the body. There are three main types of omega-3s: EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid), and ALA (alpha-linolenic acid). EPA and DHA are found primarily in fatty fish such as salmon, tuna, and sardines, while ALA is found in plant-based sources such as flaxseeds, chia seeds, and walnuts.

Benefits:

- Important for brain function, heart health, and reducing inflammation in the body
- Can help improve cognitive function, reduce the risk of heart disease and stroke, lower blood pressure, and reduce symptoms of inflammation in conditions such as arthritis

Signs of deficiency:

- Dry skin
- Brittle hair and nails
- Fatigue
- Poor memory
- Neurological problems
- Increased risk of heart disease.

Optimal Dosages:

- General health maintenance: 1,000–2,000 mg combined EPA and DHA daily
- Cardiovascular support: 2,000–4,000 mg EPA and DHA daily
- Anti-inflammatory and autoimmune support: 3,000–5,000 mg EPA and DHA daily
- Brain health and mood support: 2,000–3,000 mg daily with a higher EPA ratio
- Depression specifically: higher EPA formulations are best—look for at least 60% EPA
- Always look at EPA and DHA content specifically—not total fish oil capsule weight
- Choose triglyceride form over ethyl ester form for superior bioavailability
- Take with a fat-containing meal
- Algae-based omega-3 is the preferred choice for vegans and vegetarians—and is actually the original source that fish obtain their omega-3 from
- Refrigerate after opening to prevent oxidation
- Check for third-party testing for heavy metals and oxidation levels (TOTOX score)



PINE BARK EXTRACT (PYCNOGENOL)

Pine bark extract—most commonly known by the branded name Pycnogenol—is derived from the bark of the French maritime pine tree and contains a highly concentrated blend of procyanidins, bioflavonoids, and phenolic acids. It is one of the most potent and versatile antioxidant complexes found in nature, with an impressive breadth of clinical research spanning cardiovascular health, cognitive function, skin health, circulation, and sports performance.

How it helps:

- Exceptionally potent antioxidant—more powerful than vitamins C and E
- Supports healthy circulation and blood flow
- Supports cardiovascular health and healthy blood pressure
- Promotes healthy skin—stimulates collagen and hyaluronic acid production
- Supports cognitive function and memory
- Reduces inflammation throughout the body
- Supports healthy blood sugar and insulin sensitivity
- Supports eye health and retinal circulation
- Reduces exercise-induced oxidative stress and supports recovery
- Supports healthy erectile function via nitric oxide production

Optimal Dosages:

- General antioxidant and health support: 50–100 mg daily
- Cardiovascular and circulation support: 100–200 mg daily
- Cognitive and skin support: 100–150 mg daily
- Athletic performance and recovery: 100–200 mg daily
- Pycnogenol is the most clinically researched standardized form—look for this specific branded ingredient
- Can be taken with or without food
- Effects are cumulative—allow 4–6 weeks for full benefits
- Very well tolerated—occasional mild digestive upset at higher doses
- Pairs synergistically with vitamin C, CoQ10, and omega-3

Signs of Deficiency:

- Pine bark extract is not an essential nutrient but low intake alongside poor antioxidant status is associated with:
 - Poor circulation and cold extremities
 - Elevated blood pressure
 - Poor skin elasticity and premature aging
 - Brain fog and poor memory
 - High oxidative stress and inflammation
 - Poor blood sugar regulation
 - Exercise intolerance and poor recovery



RESVERATROL

Resveratrol is a naturally occurring polyphenol produced by plants in response to stress, injury, and pathogen attack. It is found in the skin of red grapes, berries, and peanuts, and has gained widespread attention for its potential role in longevity and healthy aging. Resveratrol activates sirtuins, a family of proteins associated with cellular longevity and DNA repair, and has been extensively studied for its cardiovascular, neuroprotective, anti-inflammatory, and anti-aging properties.

How it helps:

- Activates sirtuins – longevity-associated proteins linked to healthy aging
- Powerful antioxidant and anti-inflammatory
- Supports cardiovascular health and healthy blood pressure
- Supports brain health and may protect against neurodegeneration
- Supports healthy blood sugar and insulin sensitivity
- May inhibit cancer cell growth – emerging research
- Supports healthy estrogen metabolism
- Promotes mitochondrial biogenesis – creation of new mitochondria
- Supports healthy weight management
- Pairs synergistically with NAD+ precursors (NMN, NR) for longevity support.

Signs of Deficiency:

- Resveratrol is not an essential nutrient but low polyphenol intake broadly is associated with:
- Elevated cardiovascular risk
- Poor cognitive aging
- Elevated inflammatory markers
- Poor blood sugar regulation
- Accelerated cellular aging
- Mitochondrial dysfunction

Resveratrol-Rich Foods:

- Red grape skin and red wine
- Blueberries and bilberries
- Cranberries
- Mulberries
- Peanuts and peanut butter
- Pistachios
- Dark chocolate and cocoa
- Japanese knotweed (highest known source—basis of most supplements)
- Lingonberries
- Pomegranate

Optimal Dosages:

- General health and antioxidant support: 150–500 mg daily
- Longevity and anti-aging support: 500–1,000 mg daily
- Cardiovascular and metabolic support: 500–1,000 mg daily
- Trans-resveratrol is the only biologically active form—always verify this is what is in your supplement
- Bioavailability is a significant challenge—choose micronized or liposomal forms for best absorption
- Take with a fat-containing meal
- Pairs powerfully with quercetin and NMN/NR for synergistic longevity support
- May interact with blood thinners and certain medications—consult a practitioner at high doses

GLUTATHIONE

Glutathione is the body's master antioxidant—a tripeptide composed of three amino acids: glutamine, cysteine, and glycine. It is produced in every cell but found in highest concentrations in the liver, where it plays a central role in detoxification. Unlike most antioxidants consumed through diet, glutathione works from within the cell—neutralizing free radicals, regenerating other antioxidants including vitamins C and E, supporting the immune system, and directly facilitating the removal of toxins, heavy metals, and carcinogens from the body. Glutathione levels decline significantly with age, chronic illness, poor diet, persistent stress, and environmental toxin exposure, making it one of the most important compounds to actively support as part of any serious health and longevity protocol.

How it helps:

- Master intracellular antioxidant — neutralises free radicals within cells
- Central to liver detoxification — phase II conjugation and toxin removal
- Regenerates vitamins C and E after they neutralise free radicals
- Supports and modulates healthy immune function
- Supports mitochondrial health and cellular energy production
- Promotes healthy skin — inhibits melanin overproduction
- Supports brain health and neuroprotection
- Facilitates removal of heavy metals and environmental toxins
- Supports healthy insulin sensitivity and metabolic function
- Supports healthy inflammatory balance throughout the body
- Protects DNA from oxidative damage

Signs of Deficiency:

- Fatigue and persistently low energy
- Frequent illness and compromised immune response
- Chemical, environmental, and fragrance sensitivities
- Poor detoxification capacity and toxic burden
- Skin dullness, hyperpigmentation, and accelerated aging
- Neurological symptoms and brain fog
- Elevated oxidative stress markers
- Impaired liver function and elevated liver enzymes
- Increased susceptibility to chronic and degenerative disease
- Poor recovery from illness, exercise, or stress

Glutathione-Rich Foods:

- Asparagus (highest known plant source)
- Avocado
- Spinach and leafy greens
- Okra
- Broccoli and cruciferous vegetables broadly
- Garlic and onions (support endogenous production via sulfur compounds)
- Beef liver
- Eggs
- Walnuts
- Tomatoes

Optimal Dosages:

- General antioxidant and immune support: 250–500 mg daily
- Liver detox and therapeutic support: 500–1,000 mg daily
- Skin brightening and anti-aging: 500–1,000 mg daily
- Heavy metal detoxification: 500–1,000 mg daily alongside NAC and ALA
- Liposomal glutathione is strongly preferred—standard oral glutathione is poorly absorbed as it is largely broken down in the digestive tract before reaching cells
- S-acetyl glutathione is another highly bioavailable oral form that bypasses digestive breakdown
- Setria glutathione is the most clinically researched branded form—look for this specific ingredient
- Supporting endogenous production is often more effective than supplementing glutathione directly—prioritize NAC, glycine, vitamin C, selenium, and ALA to boost the body's own synthesis
- IV glutathione is available through functional medicine practitioners for therapeutic and acute applications—significantly more bioavailable than oral forms
- Take on an empty stomach for best absorption
- Pairs powerfully with NAC, ALA, vitamin C, and selenium—these work synergistically to maximize glutathione activity and recycling

SPIRULINA & CHLORELLA

Spirulina and chlorella are freshwater microalgae that represent two of the most nutrient-dense foods on the planet. Spirulina is a blue-green algae and one of the oldest life forms on earth, while chlorella is a green algae with a unique hard cell wall that must be cracked for human digestion. Together they provide an extraordinary concentration of protein, vitamins, minerals, antioxidants, and chlorophyll—making them among the most powerful whole-food supplements available. Chlorella in particular is one of the most effective natural heavy metal chelators known.

How it helps:

- Exceptional nutritional density—protein, B vitamins, iron, magnesium, and more
- Spirulina: powerful antioxidant and anti-inflammatory via phycocyanin
- Chlorella: binds and removes heavy metals and environmental toxins
- Supports healthy immune function
- Supports liver health and detoxification
- Promotes healthy cholesterol and triglyceride levels
- Supports healthy blood sugar regulation
- Spirulina: supports athletic performance and reduces oxidative stress
- Chlorella: supports healthy gut microbiome and digestion
- Supports healthy blood pressure

Signs of Deficiency:

- Not essential nutrients but low intake associated with:
- Poor detoxification capacity
- Heavy metal burden
- Nutritional gaps particularly in plant-based diets
- Elevated cholesterol and triglycerides
- Poor immune function
- Low energy and nutritional fatigue
- Elevated inflammatory markers

Optimal Dosages:

- Spirulina: 3–10 g daily for general health; up to 15 g daily for therapeutic use
- Chlorella: 3–6 g daily for general health; 6–10 g daily for heavy metal detox support
- Start with lower doses and increase gradually—both can cause detox reactions if introduced too quickly
- Always choose broken cell wall chlorella—essential for bioavailability
- Choose products tested for heavy metal contamination—ironically, poor quality algae supplements can contain the very toxins you are trying to eliminate
- Chlorella can bind to medications—take at least 2 hours apart from any prescription drugs
- Powder form is more cost effective at therapeutic doses; tablets are more convenient for travel.



GUT & METABOLIC



BUTYRATE

Butyrate is a short-chain fatty acid (SCFA) produced when beneficial gut bacteria ferment dietary fiber in the colon. It is the primary fuel source for colonocytes—the cells lining the colon wall—making it absolutely foundational for gut barrier integrity, colon health, and the prevention of leaky gut. Beyond the gut, butyrate has far-reaching effects on immune regulation, inflammation, brain health, and metabolic function. Despite its critical importance, butyrate production is severely compromised in people eating low-fiber, highly processed diets—which describes the majority of the modern Western world.

How it helps:

- Primary fuel source for colonocyte cells lining the colon
- Supports and repairs gut barrier integrity – reduces leaky gut
- Powerful anti-inflammatory effects throughout the body
- Supports healthy immune regulation in the gut
- Promotes healthy colon cell turnover – may reduce colorectal cancer risk
- Supports healthy blood sugar and insulin sensitivity
- Supports brain health via the gut-brain axis
- May reduce symptoms of IBS, Crohn's, and ulcerative colitis
- Supports healthy weight management
- Promotes healthy gene expression via histone deacetylase inhibition

Signs of Deficiency:

- Leaky gut and intestinal permeability
- Chronic gut inflammation and digestive dysfunction
- IBS, IBD, and inflammatory bowel symptoms
- Poor immune regulation and autoimmune tendencies
- Metabolic dysfunction and blood sugar instability
- Brain fog and poor mood via gut-brain axis disruption
- Colorectal polyps or elevated colorectal cancer risk
- Chronic fatigue linked to gut dysfunction

Butyrate-Rich Foods:

- Butyrate itself is produced by gut bacteria—not directly consumed in meaningful amounts
- Foods that promote butyrate production:
- Resistant starch (cooled cooked potatoes, green bananas, cooked and cooled rice)
- Oats
- Legumes (beans, lentils, chickpeas)
- Garlic and onions
- Asparagus
- Jerusalem artichokes
- Leeks
- Whole grains
- Cooked and cooled pasta
- High-fiber vegetables broadly

Optimal Dosages:

- General gut health support: 300–600 mg daily of supplemental butyrate
- Therapeutic gut repair: 600–1,200 mg daily in divided doses
- Sodium butyrate and calcium/magnesium butyrate are the most common supplemental forms
- Tributyrin is an emerging form with superior bioavailability and better tolerability
- Enteric-coated formulas are preferred to ensure delivery to the colon rather than absorption in the small intestine
- The most effective long-term strategy is producing butyrate naturally through adequate fiber intake—aim for 25–35 g of diverse dietary fiber daily
- Pairs powerfully with prebiotic fiber and probiotics—the complete gut health triad
- Start low and increase gradually— butyrate supplementation can initially cause bloating as the gut microbiome adjusts

COLLAGEN/COLLAGEN PEPTIDES

Collagen is the most abundant protein in the human body—comprising approximately 30% of total protein content—and serves as the primary structural scaffolding for skin, bones, joints, tendons, ligaments, gut lining, and blood vessels. It is composed primarily of glycine, proline, and hydroxyproline. Collagen production declines at approximately 1% per year from the mid-20s onward, accelerating with sun exposure, smoking, poor diet, and chronic stress. Collagen peptides are hydrolyzed collagen—broken down into smaller, highly bioavailable fragments that are efficiently absorbed and distributed to collagen-producing cells throughout the body.

How it helps:

- Supports skin elasticity, hydration, and healthy aging
- Supports joint health, cartilage integrity, and reduces joint pain
- Supports gut lining integrity and repair
- Promotes bone density and strength
- Supports tendon and ligament strength and recovery
- Provides highly bioavailable glycine and proline for endogenous collagen synthesis
- Supports healthy hair and nail growth
- Supports muscle mass maintenance
- Supports cardiovascular health — maintains arterial wall integrity
- Promotes wound healing and tissue repair

Signs of Deficiency:

- Premature skin aging, wrinkles, and poor elasticity
- Joint pain and cartilage degradation
- Poor gut barrier integrity and digestive issues
- Brittle hair and nails
- Bone loss and poor bone density
- Slow wound healing
- Tendon and ligament injuries
- Poor muscle recovery

Collagen-Rich Foods:

- Bone broth (richest food source)
- Chicken skin and feet
- Pork skin and trotters
- Beef (especially tough cuts with connective tissue)
- Fish skin and scales
- Gelatin
- Egg whites (contain proline)
- Sardines (eaten with skin)
- Slow-cooked meats on the bone
- Oxtail and short ribs

Optimal Dosages:

- General health and skin support: 5–10 g daily
- Joint and cartilage support: 10–15 g daily
- Gut repair support: 10–20 g daily
- Athletic performance and recovery: 15–20 g daily
- Always choose hydrolyzed collagen peptides for maximum bioavailability
- Type I and III collagen—skin, hair, nails, gut, and bone support
- Type II collagen—specifically for joint and cartilage support (undenatured type II collagen at just 40 mg daily is highly effective)
- Take vitamin C alongside collagen—essential for converting proline to hydroxyproline and stabilizing collagen structure
- Marine collagen has the smallest peptide size and highest bioavailability
- Mix powder into coffee, smoothies, or soups—flavorless and dissolves easily
- Pairs powerfully with glycine, proline, vitamin C, and silica

DIGESTIVE ENZYMES

Digestive enzymes are proteins produced primarily by the pancreas, stomach, and small intestine that break down food into absorbable nutrients. Without adequate enzyme activity, even the most nutrient-dense diet cannot be properly utilized—nutrients pass through unabsorbed, feeding gut bacteria and causing fermentation, bloating, and inflammation. Enzyme production naturally declines with age, stress, and gut damage, making supplemental digestive enzymes one of the most foundational and frequently overlooked interventions for digestive health and overall nutrient status.

How it helps:

- Breaks down proteins, fats, and carbohydrates for optimal absorption
- Reduces bloating, gas, and digestive discomfort
- Supports nutrient absorption across all food groups
- Reduces the digestive burden on the pancreas
- Supports gut lining health by reducing undigested food particles
- May reduce food sensitivities and reactions
- Supports healthy inflammatory response in the gut
- Particularly valuable for those with low stomach acid, IBS, or pancreatic insufficiency
- Supports healthy microbiome by reducing fermentation of undigested food
- Supports energy levels via improved nutrient extraction.

Signs of Deficiency:

- Bloating and gas after meals
- Undigested food in stool
- Floating or greasy stools
- Nutrient deficiencies despite adequate dietary intake
- Food intolerances and sensitivities
- Fatigue after eating
- Nausea after fatty meals
- Chronic digestive discomfort and IBS symptoms
- Poor absorption of fat-soluble vitamins (A, D, E, K)

Digestive Enzyme-Rich Foods:

- Pineapple (bromelain—protein digestion)
- Papaya (papain—protein digestion)
- Mango (amylases—starch digestion)
- Honey (diastase and invertase)
- Bananas (amylase and maltase)
- Fermented foods (kimchi, sauerkraut, kefir—contain microbial enzymes)
- Avocado (lipase—fat digestion)
- Ginger (zingibain—protein digestion)
- Raw apple cider vinegar (supports stomach acid production)
- Kiwi (actinidin—protein digestion)

Optimal Dosages:

- General digestive support: Take 1-2 capsules of a broad-spectrum enzyme blend with each main meal
- Key enzymes to look for in a quality broad-spectrum formula:
 - Protease—breaks down protein
 - Lipase—breaks down fats
 - Amylase—breaks down carbohydrates and starch
 - Lactase—breaks down lactose (dairy)
 - Cellulase—breaks down plant fiber
 - Alpha-galactosidase—reduces gas from beans and cruciferous vegetables
- Bromelain and papain—plant-based proteases with anti-inflammatory properties
- Always take immediately before or at the beginning of a meal—taking after eating significantly reduces effectiveness
- Betaine HCl is often valuable alongside enzymes for those with low stomach acid—a root cause of poor protein digestion
- Those with active ulcers or gastritis should consult a practitioner before using high-protease formulas

FIBER/PREBIOTIC FIBER

Dietary fiber is the indigestible portion of plant foods that passes through the digestive system largely intact, feeding beneficial gut bacteria, supporting bowel regularity, and exerting profound effects on metabolic and immune health. Prebiotic fiber specifically refers to fibers that selectively feed beneficial probiotic bacteria—acting as the fuel that allows a healthy microbiome to thrive. Despite fiber being one of the most well-researched and consistently beneficial dietary components, the vast majority of people on modern diets consume less than half the optimal amount.

How it helps:

- Feeds and supports beneficial gut bacteria (prebiotic effect)
- Promotes healthy bowel regularity and stool consistency
- Supports healthy blood sugar — slows glucose absorption
- Supports healthy cholesterol levels — binds bile acids
- Promotes butyrate production — fuels colon cells
- Supports healthy weight management — increases satiety
- Supports cardiovascular health
- Reduces risk of colorectal cancer
- Supports healthy immune function via microbiome modulation
- Reduces systemic inflammation

Signs of Deficiency:

- Constipation and poor bowel regularity
- Poor gut microbiome diversity
- Blood sugar spikes and insulin resistance
- Elevated LDL cholesterol
- Poor satiety and difficulty maintaining healthy weight
- Chronic inflammation and poor immune function
- Increased colorectal cancer risk
- Diverticular disease

Digestive Enzyme-Rich Foods:

- Legumes (beans, lentils, chickpeas—richest sources)
- Avocado
- Chia seeds and flaxseeds
- Oats
- Artichokes and Jerusalem artichokes
- Broccoli and cruciferous vegetables
- Sweet potato
- Apples and pears (with skin)
- Berries
- Whole grains

Optimal Dosages:

- General health: 25–35 g total dietary fiber daily from diverse food sources
- Prebiotic fiber supplementation: 5–10 g daily — gradually increase to avoid gas and bloating
- Key prebiotic fiber types to include:
- Inulin and FOS (fructooligosaccharides)—found in chicory root, garlic, onions
- GOS (galactooligosaccharides)—found in legumes, supports bifidobacteria
- Psyllium husk—soluble fiber, excellent for cholesterol and bowel regularity
- Resistant starch—feeds butyrate-producing bacteria
- Beta-glucan—oats and mushrooms, exceptional for immune and cholesterol support
- Always increase fiber gradually and with adequate hydration to prevent bloating and discomfort
- Diversity is key—aim for fiber from as many different plant sources as possible
- Pairs powerfully with probiotics and butyrate—the complete gut health triad



PROBIOTICS

Probiotics are live microorganisms, primarily bacteria and some yeasts, that, when consumed in adequate amounts, confer measurable health benefits to the host. The human gut microbiome contains trillions of microorganisms representing thousands of species, collectively performing functions critical to digestion, immunity, hormone metabolism, neurotransmitter production, and inflammation regulation. Modern life—antibiotics, processed food, chlorinated water, chronic stress, and cesarean birth—has profoundly disrupted the ancestral microbiome, making deliberate probiotic support more important than ever.

How they help:

- Restores and maintains healthy gut microbiome diversity
- Supports gut barrier integrity and reduces leaky gut
- Supports healthy immune function — approximately 70% of immune tissue is in the gut
- Supports production of neurotransmitters including serotonin and GABA
- Supports healthy digestion and nutrient absorption
- Reduces symptoms of IBS, bloating, and diarrhea
- Supports healthy cholesterol metabolism
- Promotes vaginal and urinary tract health in women
- Supports healthy mood and mental health via gut-brain axis
- Reduces antibiotic-associated diarrhea and gut damage

Signs of Deficiency:

- Digestive dysfunction—bloating, gas, diarrhea, constipation
- Frequent infections and poor immune response
- Skin conditions—eczema, acne, rosacea
- Poor mood and mental health
- Food intolerances and sensitivities
- Recurrent vaginal yeast infections or UTIs
- Brain fog and fatigue
- Autoimmune tendencies
- Antibiotic-associated gut disruption

Probiotic-Rich Foods:

- Yogurt with live active cultures
- Kefir (dairy or water)
- Sauerkraut (unpasteurized)
- Kimchi
- Miso
- Tempeh
- Kombucha
- Fermented pickles (brine-fermented, not vinegar)
- Natto
- Aged cheeses

Optimal Dosages:

- General maintenance: 10–30 billion CFU daily of a multi-strain formula
- Post-antibiotic recovery: 50–100 billion CFU daily during and for at least 4 weeks after the antibiotic course
- Therapeutic gut repair: 50–100 billion CFU daily
- CFU (colony-forming units) is not the only measure of quality—strain specificity and survivability matter more than raw CFU count
- Look for strains with human clinical research behind them
- Delayed-release or enteric-coated capsules protect bacteria from stomach acid
- Store as directed—many probiotics require refrigeration
- Take with or just after food to improve survival through stomach acid
- Rotate strains periodically to build microbiome diversity
- Pairs powerfully with prebiotic fiber—always address both together



SPECIFIC PROBIOTICS

While general probiotic blends offer broad microbiome support, specific probiotic strains have been clinically researched for targeted health outcomes. The science of probiotics has evolved significantly, and we now understand that strain specificity matters enormously and that different strains produce vastly different effects in the body. This page outlines the most clinically validated individual strains and their specific applications, allowing for targeted probiotic selection based on individual health needs.

Key strains and their specific benefits:

Lactobacillus acidophilus NCFM

- Supports lactose digestion and reduces dairy intolerance symptoms
- Supports vaginal microbiome health
- Supports immune function and reduces allergy symptoms

Lactobacillus rhamnosus GG (LGG)

- Most clinically researched probiotic strain in the world
- Reduces duration and severity of diarrhea – particularly antibiotic-associated and traveler's diarrhea
- Supports gut barrier integrity
- Supports immune function in children and adults

Lactobacillus reuteri DSM 17938

- Supports infant colic – one of the most evidence-backed interventions
- Supports oral health – reduces harmful oral bacteria
- Supports bone density via modulation of bone metabolism
- Supports healthy cholesterol levels

Lactobacillus plantarum 299v

- Reduces IBS symptoms – bloating, gas, abdominal pain
- Supports gut barrier integrity
- Supports healthy iron absorption

Bifidobacterium longum BB536

- Supports allergy reduction – particularly seasonal allergies and eczema
- Supports immune regulation
- Supports healthy bowel regularity

Bifidobacterium infantis 35624

- Clinically proven for IBS symptom reduction
- Reduces gut inflammation
- Supports immune regulation

Saccharomyces boulardii

- A beneficial yeast—not a bacteria
- Highly researched for antibiotic-associated diarrhea prevention
- Supports gut barrier integrity during and after antibiotic use
- Resistant to antibiotics—can be taken simultaneously with antibiotic courses
- Supports recovery from *C. difficile* infection

Lactobacillus helveticus R0052 + Bifidobacterium longum R0175

- This specific combination is the most researched probiotic formulation for mental health
- Reduces anxiety, depression, and cortisol levels
- Supports the gut-brain axis—sold under the brand name Psychobiotic or Probio'Stick

Optimal Dosages:

- Strain-specific dosing varies—follow clinical research doses for each strain
- General range: 1–50 billion CFU depending on strain and application
- *Saccharomyces boulardii*: 250–500 mg (5–10 billion CFU) daily; increase to 1,000 mg during antibiotic use
- LGG for diarrhea: 10–20 billion CFU daily
- Mental health strains: follow product-specific dosing—typically 3–6 billion CFU of the combined formula
- Single-strain products are preferable when targeting a specific condition
- Multi-strain blends are preferable for general microbiome diversity maintenance



HORMONAL & SPECIALTY



DHEA (DEHYDROEPIANDROSTERONE)

DHEA is the most abundant steroid hormone in the human body and serves as the master precursor to both testosterone and estrogen. Produced primarily by the adrenal glands, DHEA peaks in the mid-20s and then declines steadily and dramatically with age—by age 70 most people have only 10–20% of their peak DHEA levels remaining. This age-related decline has made DHEA one of the most studied compounds in longevity and anti-aging research, with implications for energy, mood, immune function, body composition, bone density, and sexual health.

How it helps:

- Master precursor to testosterone and estrogen
- Supports healthy energy levels and vitality
- Supports healthy mood and emotional resilience
- Supports immune function—declines in DHEA strongly correlate with immune aging
- Supports healthy body composition—promotes lean muscle and reduces fat
- Supports bone density
- Supports healthy libido and sexual function in both men and women
- Supports cognitive function and memory
- Supports adrenal health and stress resilience
- Anti-aging effects—one of the most researched longevity hormones

Signs of Deficiency:

- Fatigue and low vitality
- Depression and poor mood
- Low libido
- Poor immune function and frequent illness
- Loss of muscle mass and increased body fat
- Poor bone density
- Brain fog and cognitive decline
- Poor stress resilience
- Dry skin
- Hormonal imbalances

DHEA-Rich Foods:

DHEA cannot be obtained meaningfully from food sources. Foods that support healthy adrenal DHEA production:

- Wild caught fatty fish
- Olive oil
- Whole eggs
- Yams and sweet potato
- Cruciferous vegetables
- Nuts and seeds
- Colourful fruits and vegetables broadly

Optimal Dosages:

- General anti-aging and vitality support: 25–50 mg daily
- Women typically respond well to lower doses: 10–25 mg daily
- Men may benefit from higher doses: 25–100 mg daily
- Always test DHEA-S levels before supplementing—a simple blood test establishes your baseline and guides appropriate dosing
- Take in the morning—DHEA follows a natural morning peak, and taking it at night may disrupt sleep
- Take with a fat-containing meal—DHEA is fat soluble
- 7-Keto DHEA is a metabolite that does not convert to sex hormones—useful for those who want metabolic and immune benefits without hormonal effects
- Those with hormone-sensitive conditions (breast cancer, prostate cancer) must consult a practitioner before supplementing
- Long-term use should be monitored with periodic hormone testing

MELATONIN

Melatonin is a hormone produced by the pineal gland in response to darkness, serving as the body's primary circadian rhythm regulator. While it is widely known as a sleep hormone, melatonin's role extends far beyond sleep—it is one of the most powerful and versatile antioxidants in the body, with significant implications for immune function, cancer protection, cardiovascular health, and healthy aging. Melatonin production declines significantly with age and is severely disrupted by artificial light exposure, particularly blue light from screens, making it one of the most commonly deficient hormones in modern populations.

How it helps:

- Regulates circadian rhythm and sleep-wake cycle
- Supports healthy sleep onset, duration, and quality
- Powerful antioxidant—particularly protective in mitochondria and the brain
- Supports healthy immune function and immune surveillance
- Significant anti-cancer properties—emerging and established research
- Supports cardiovascular health and healthy blood pressure
- Supports healthy eye health—protects retinal cells
- Supports healthy gut function via gut melatonin receptors
- Anti-inflammatory effects throughout the body
- Supports healthy aging and longevity

Signs of Deficiency:

- Difficulty falling asleep
- Poor sleep quality and frequent night waking
- Jet lag and disrupted circadian rhythm
- Fatigue and daytime sleepiness
- Seasonal mood changes
- Poor immune function
- Elevated oxidative stress
- Increased susceptibility to hormone-sensitive conditions
- Anxiety and hyperarousal at night

Melatonin- Rich Foods:

- Tart cherries and tart cherry juice (richest food source)
- Walnuts
- Eggs
- Fatty fish (salmon, sardines)
- Mushrooms
- Tomatoes
- Peppers
- Grapes
- Strawberries
- Milk (particularly warm milk—traditional wisdom supported by research)

Optimal Dosages:

- Sleep onset support: 0.5–3 mg taken 30–60 minutes before bed
- Circadian rhythm reset and jet lag: 0.5–5 mg at target bedtime
- Antioxidant and longevity support: higher doses of 10–60 mg have been used in research—consult a practitioner
- Less is often more—most people dramatically overdose on melatonin; 0.5–1 mg is frequently as effective as 5–10 mg for sleep onset with fewer next-day grogginess effects
- Always start with the lowest effective dose
- Use immediate release for sleep onset difficulties and extended release for maintaining sleep through the night
- Prioritize light management alongside supplementation—blue light blocking glasses after dark and morning sunlight exposure are foundational
- Not recommended for long-term nightly use without practitioner guidance in children
- Those on blood thinners, immunosuppressants, or diabetes medications should consult a practitioner

SAME (S-ADENOSYL METHIONINE)

SAMe is a naturally occurring compound found in virtually every cell in the body and is the primary methyl donor in over 100 biochemical reactions—a process called methylation that underpins DNA repair, neurotransmitter synthesis, gene expression, detoxification, and cellular repair. SAMe is synthesized from the amino acid methionine and ATP, and its production is dependent on adequate levels of folate, B6, and B12. It has one of the strongest evidence bases of any natural compound for depression, joint health, and liver protection—with clinical trials comparing its antidepressant effects favorably to pharmaceutical antidepressants in multiple studies.

How it helps:

- Primary methyl donor—supports methylation throughout the body
- Clinically validated antidepressant effects—well researched as both standalone and adjunct to antidepressants
- Supports joint health and reduces osteoarthritis pain—comparable to NSAIDs in some studies
- Supports liver health and detoxification—used clinically in liver disease
- Supports healthy neurotransmitter production—serotonin, dopamine, norepinephrine
- Supports DNA methylation and healthy gene expression
- Supports healthy myelin sheath integrity—relevant in neurological conditions
- Supports healthy estrogen metabolism via liver methylation
- Anti-inflammatory effects throughout the body
- Supports healthy cognitive function and memory

Signs of Deficiency:

- Depression and persistently low mood
- Joint pain and stiffness
- Poor liver function and detoxification
- Brain fog and cognitive decline
- Fatigue and low energy
- Impaired methylation—particularly relevant in those with MTHFR gene variants
- Poor stress resilience
- Hormonal imbalances driven by poor estrogen clearance
- Neurological symptoms

SAMe-Rich Foods:

- SAMe cannot be obtained from food directly
- Foods that support endogenous SAMe production:
- Methionine-rich foods—beef, lamb, eggs, fish, dairy, Brazil nuts
- Folate-rich foods—leafy greens, legumes, avocado
- B12-rich foods—organ meats, shellfish, sardines, eggs
- B6-rich foods—chickpeas, salmon, chicken, potatoes

Optimal Dosages:

- General methylation and mood support: 400–800 mg daily
- Depression: 800–1,600 mg daily in divided doses—take in the morning, as SAMe can be energizing
- Joint and osteoarthritis support: 600–1,200 mg daily in divided doses
- Liver support: 800–1,600 mg daily
- Always take on an empty stomach—food significantly reduces absorption
- Take it in the morning or early afternoon—SAMe has an energizing effect that can disrupt sleep if taken late in the day
- Always ensure adequate B12, folate, and B6 alongside SAMe—these are essential cofactors for the methylation cycle; without them, SAMe supplementation can paradoxically raise homocysteine
- Do not combine with antidepressants without practitioner supervision—risk of serotonin syndrome, particularly with SSRIs and MAOIs
- Those with bipolar disorder should use it with caution—SAMe may trigger manic episodes
- Choose butanedisulfonate form for best stability and bioavailability

ST. JOHN'S WORT (HYPERICUM PERFORATUM)

St. John's Wort is a flowering plant with one of the longest histories of medicinal use in Western herbal medicine, used for centuries to treat low mood, nerve pain, and wound healing. It is now one of the most extensively researched herbal medicines in the world—with a substantial body of clinical evidence supporting its efficacy for mild to moderate depression, anxiety, and seasonal affective disorder. Its primary active compounds—hypericin and hyperforin—work through multiple mechanisms, including serotonin, dopamine, and norepinephrine reuptake inhibition, giving it a broad-spectrum antidepressant mechanism that closely parallels pharmaceutical antidepressants. It is also one of the most important supplements in terms of drug interactions—a fact that must be clearly understood before use.

How it helps:

- Clinically validated for mild to moderate depression—comparable to antidepressants in multiple trials
- Supports healthy mood and emotional resilience
- Reduces anxiety and promotes calm
- Supports healthy sleep quality
- May reduce symptoms of seasonal affective disorder (SAD)
- Supports nerve health and reduces nerve pain
- Anti-inflammatory effects
- Supports healthy menopausal mood symptoms
- Supports healthy OCD symptom management
- Promotes wound healing when applied topically

Signs of Deficiency:

St. John's Wort is not an essential nutrient, but low mood presentations it addresses include:

- Persistent low mood and depression
- Anxiety and excessive worry
- Seasonal mood changes and SAD
- Poor sleep quality
- Nerve pain and sensitivity
- Menopausal mood disturbances
- Low motivation and emotional flatness

St. John's Wort-Rich Foods:

- St. John's Wort is not found in conventional food sources
- Available as standardized capsules, tablets, liquid tincture, and topical oil
- Tea made from dried St. John's Wort flowers provides mild benefit but does not deliver therapeutic doses of active compounds

Optimal Dosages:

- General mood and anxiety support: 300 mg three times daily of standardized extract
- Depression and SAD: 900 mg daily in divided doses—the most researched therapeutic dose
- Always choose extracts standardized to 0.3% hypericin and ideally 3–5% hyperforin content
- Allow 4–6 weeks for full antidepressant effects—do not judge efficacy before this point
- Take with food to reduce digestive sensitivity
- **CRITICAL DRUG INTERACTIONS**—St. John's Wort is one of the most significant herbal drug interactors known:
 - Never combine with SSRIs, SNRIs, MAOIs, or 5-HTP—serious risk of serotonin syndrome
 - Significantly reduces effectiveness of oral contraceptives—use additional contraception
 - Reduces effectiveness of warfarin, cyclosporine, HIV medications, and chemotherapy agents
 - Reduces effectiveness of digoxin—serious cardiac implications
 - Causes photosensitivity—avoid prolonged sun exposure and tanning beds during use
 - Not recommended during pregnancy or breastfeeding
 - Always inform your doctor and pharmacist that you are taking St. John's Wort

SAFFRON (CROCUS SATIVUS)

Saffron is the world's most expensive spice by weight. It is harvested from the stigmas of the *Crocus sativus* flower and has been used in Persian, Indian, and Mediterranean traditional medicine for thousands of years. Modern research has revealed a remarkable breadth of clinical applications, with saffron emerging as one of the most promising natural compounds for depression, anxiety, appetite regulation, and eye health. Its primary active compounds—crocin, crocetin, and safranal—work through multiple pathways, including serotonin reuptake inhibition, antioxidant activity, and anti-inflammatory mechanisms. Clinical trials have repeatedly demonstrated antidepressant effects comparable to fluoxetine (Prozac) and sertraline at standard supplemental doses.

How it helps:

- Clinically validated antidepressant effects—comparable to pharmaceutical antidepressants in multiple trials
- Supports healthy mood and reduces symptoms of depression and anxiety
- Supports healthy appetite regulation—reduces snacking and hedonic eating
- Supports eye health—protects retinal cells and may slow macular degeneration
- Powerful antioxidant—crocin and crocetin are exceptionally potent
- Supports healthy cognitive function and memory
- Supports healthy libido and sexual function—particularly antidepressant-induced sexual dysfunction
- Anti-inflammatory effects throughout the body
- Supports healthy sleep quality
- May support PMS symptom reduction

Signs of Deficiency:

- Saffron is not an essential nutrient, but conditions it addresses include:
- Depression and persistent low mood
- Anxiety and emotional dysregulation
- Compulsive snacking and emotional eating
- Poor eye health and age-related macular changes
- Poor cognitive function and memory
- Low libido
- PMS and mood-related menstrual symptoms
- Poor sleep quality

Saffron-Rich Foods:

- Saffron threads (culinary use in paella, risotto, Persian rice dishes, golden milk)
- Note: Therapeutic doses require standardized supplemental extracts—culinary amounts provide antioxidant benefit but not clinical mood effects

Optimal Dosages:

- General mood and antioxidant support: 15–30 mg daily
- Depression and anxiety: 30 mg daily — the dose used in the majority of clinical trials; typically split as 15 mg twice daily
- Appetite regulation and weight management: 176–180 mg daily of saffron extract
- Eye health support: 20–30 mg daily
- Always choose standardized extracts—look for products standardized to safranal and crocin content
- Satiereal is the most clinically researched branded saffron extract for appetite regulation
- Affron is a high-quality standardized extract with strong mood and sleep research
- Culinary saffron (in cooking) provides some benefit, but therapeutic doses require supplemental extracts
- Very well tolerated at recommended doses—high doses (5 g+) can be toxic but are never used supplementally
- Not recommended during pregnancy at supplemental doses—may stimulate uterine contractions
- Pairs well with omega-3, magnesium, and vitamin D for comprehensive mood support

PHOSPHATIDYLSERINE

Phosphatidylserine (PS) is a phospholipid—a fat-like molecule—that forms a critical component of cell membranes throughout the body, with the highest concentrations found in the brain. It plays an essential role in cell signaling, neurotransmitter release, and maintaining the fluidity and integrity of neuronal membranes. Phosphatidylserine is one of the few supplements to have received a qualified health claim from the FDA for cognitive decline reduction, and it is among the most extensively researched natural compounds for brain health, memory, and cortisol regulation.

How it helps:

- Supports healthy cell membrane integrity—particularly in the brain
- Supports memory, learning, and cognitive function
- Supports healthy neurotransmitter release—dopamine, acetylcholine, serotonin
- Reduces cortisol response to physical and psychological stress
- Supports healthy mood and emotional resilience
- Supports athletic performance—blunts exercise-induced cortisol spike
- May slow age-related cognitive decline
- Supports healthy ADHD symptom management—particularly in children
- Supports healthy sleep via cortisol regulation
- Supports brain recovery from traumatic brain injury.

Signs of Deficiency:

- Poor memory and forgetfulness
- Brain fog and difficulty concentrating
- Cognitive decline and age-related memory loss
- Poor stress resilience and elevated cortisol
- Depression and poor mood
- ADHD symptoms and poor attention
- Poor sleep driven by elevated evening cortisol
- Difficulty learning and retaining new information
- Mental fatigue

Phosphatidylserine-Rich Foods:

- White beans (richest plant source)
- Soy lecithin and soy products
- Egg yolks
- Beef liver and organ meats
- Chicken liver
- Herring and mackerel
- Tuna
- Chicken and turkey
- Veal
- Dairy products

Optimal Dosages:

- General brain health and memory support: 100–200 mg daily
- Cognitive decline and therapeutic support: 300–400 mg daily in divided doses
- Cortisol and stress management: 400–800 mg daily—most studied dose for cortisol blunting
- Athletic performance and recovery: 400–800 mg daily
- Always choose soy-derived or sunflower-derived phosphatidylserine—bovine-derived PS is no longer widely available
- Sunflower-derived PS is preferred for those avoiding soy
- Take with a fat-containing meal for best absorption
- Can be taken in the morning for cognitive support or in the evening for cortisol and sleep support
- Effects are cumulative—allow 4–8 weeks for full cognitive benefits
- Very well tolerated—occasional mild digestive upset at higher doses

PREGNENOLONE

Pregnenolone is a steroid hormone synthesized from cholesterol in the mitochondria and is the precursor to virtually all other steroid hormones in the body, including DHEA, progesterone, cortisol, testosterone, and estrogen. Often called the "mother hormone" or "grandmother hormone," pregnenolone sits at the very top of the hormonal cascade. Like DHEA, pregnenolone levels peak in the mid-20s and decline steeply with age. Beyond its role as a hormone precursor, pregnenolone has significant direct neurological effects—it is one of the most abundant neurosteroids in the brain, supporting memory, mood, and neuroprotection.

How it helps:

- Precursor to all major steroid hormones—DHEA, progesterone, cortisol, testosterone, and estrogen
- Supports memory and cognitive function—one of the most potent memory-enhancing neurosteroids known
- Supports healthy mood and emotional wellbeing
- Supports healthy energy levels and vitality
- Supports stress resilience via cortisol pathway modulation
- Promotes healthy sleep quality
- Supports neuroprotection and brain health
- Supports healthy immune function
- May support myelin sheath integrity—relevant to neurological conditions
- Supports healthy inflammatory balance

Signs of Deficiency:

- Fatigue and low vitality
- Poor memory and cognitive decline
- Depression and low mood
- Poor stress resilience
- Hormonal imbalances across the board
- Poor sleep quality
- Brain fog
- Low libido
- Joint pain and stiffness
- Accelerated aging

Optimal Dosages:

- General health and hormone support: 10–30 mg daily
- Cognitive and memory support: 50–100 mg daily
- Anti-aging and hormonal support: 30–100 mg daily
- Always test hormone levels before supplementing—pregnenolone sits at the top of the hormonal cascade and influences all downstream hormones; unsupervised high-dose use can have unintended hormonal effects
- Take in the morning—supports daytime energy and cognition
- Take with a fat-containing meal—pregnenolone is fat soluble
- Start low (10 mg) and increase gradually while monitoring symptoms and hormone levels
- Cycle use—5 days on, 2 days off—is a common approach to prevent desensitization
- Those with hormone-sensitive conditions or on hormonal medications must work with a practitioner
- Periodic hormone panel testing is strongly recommended during supplementation

SPERMIDINE

Spermidine is a naturally occurring polyamine compound found in virtually all living cells, where it plays a fundamental role in cell growth, DNA stability, and protein synthesis. It has emerged as one of the most exciting longevity compounds in modern nutritional science due to its remarkable ability to trigger autophagy—the cellular self-cleaning process by which the body identifies, breaks down, and recycles damaged cells, proteins, and organelles. Autophagy is one of the most important mechanisms of healthy aging and disease prevention, and spermidine is one of the few dietary compounds that can meaningfully activate it. Like many critical compounds, spermidine levels decline significantly with age.

How it helps:

- Triggers autophagy – the body's cellular self-cleaning and renewal process
- Supports healthy aging and longevity at the cellular level
- Supports cardiovascular health – clinically shown to reduce cardiovascular mortality risk
- Supports brain health and may reduce risk of neurodegeneration including Alzheimer's
- Supports healthy immune function and immune aging
- Promotes healthy hair growth and hair follicle cycling
- Supports healthy liver function
- Supports DNA stability and repair
- May support healthy fertility in both men and women
- Anti-inflammatory effects throughout the body

Signs of Deficiency:

- Accelerated cellular aging
- Poor autophagy and cellular waste accumulation
- Increased risk of neurodegenerative conditions
- Poor cardiovascular health markers
- Impaired immune function
- Hair thinning and poor hair follicle health
- Elevated systemic inflammation
- Poor liver health
- Reduced stress resilience at the cellular level

Spermidine-Rich Foods:

- Wheat germ (richest known food source –approximately 2,434 nmol/g)
- Aged cheese (cheddar, parmesan, brie)
- Mushrooms (shiitake particularly)
- Soybeans and soy products (natto especially)
- Peas and legumes
- Corn
- Broccoli and cruciferous vegetables
- Whole grains
- Chicken liver
- Green peppers

Optimal Dosages:

- General health and longevity support: 1–5 mg daily
- Therapeutic anti-aging support: 5–10 mg daily
- Spermidine supplementation is a rapidly evolving field—most current supplements provide 1–2 mg per dose derived from wheat germ extract, which is the richest known food source
- Spermine is a related polyamine that works synergistically with spermidine
- Autophagy benefits are enhanced when spermidine is taken during periods of fasting or alongside intermittent fasting protocols
- Very well tolerated—no significant adverse effects reported at supplemental doses
- Pairs synergistically with other autophagy-supporting practices: intermittent fasting, exercise, and rapamycin (under medical supervision)
- An emerging area of research—stay current with evolving dosing guidance as the science develops

A NOTE ON CONTRAINDICATIONS

The information contained in this guide is intended for educational purposes only and should never replace the personalized guidance of a qualified healthcare practitioner. While every nutrient and compound featured in these pages has a well-established safety profile at the doses outlined, there are important considerations to be aware of before beginning any new supplement protocol.

Medications and supplement interactions to be aware of:

- Blood thinners (warfarin, aspirin, heparin): Vitamins E and K, omega-3, CoQ10, garlic, and nattokinase can all affect clotting. Always consult your doctor before supplementing if you are on anticoagulant therapy.
- Diabetes medications: Insulin, berberine, chromium, ALA, magnesium, and cinnamon can lower blood sugar and may require medication adjustment under medical supervision.
- Thyroid medications: Iodine, selenium, iron, calcium, and magnesium can all interfere with thyroid medication absorption or activity. Always separate thyroid medications from supplements by at least 2–4 hours.
- Antidepressants and psychiatric medication: 5-HTP, L-tryptophan, St John's Wort, and SAMe should never be combined with SSRIs, SNRIs, or MAOIs without practitioner supervision due to risk of serotonin syndrome.
- Chemotherapy and immunosuppressants: High dose antioxidants and immune-stimulating supplements may interfere with certain cancer treatments. Always work closely with your oncologist.
- ACE inhibitors and blood pressure medications: Potassium, magnesium, CoQ10, and omega-3 can affect blood pressure. Monitor carefully and consult your prescribing doctor.
- Proton pump inhibitors (PPIs): Significantly deplete magnesium, B12, zinc, and iron. If you are on long-term PPI therapy, targeted supplementation of these nutrients is strongly advisable under guidance.
- Oral contraceptives: Deplete B6, B12, folate, magnesium, zinc, and selenium. Women on the pill should pay particular attention to these nutrients.
- Metformin: Significantly depletes vitamin B12 and CoQ10. Supplementation of both is strongly advisable for anyone on long-term metformin therapy.
- Statins: Critically deplete CoQ10. Supplementation is considered essential by many functional medicine practitioners for anyone on statin therapy.

A NOTE ON CONTRAINDICATIONS

Special populations requiring extra caution:

- **Pregnancy and breastfeeding:** Always work with a qualified practitioner before supplementing during pregnancy. Vitamin A (preformed retinol) in particular must not exceed 10,000 IU daily during pregnancy.
- **Children and adolescents:** Doses throughout this guide are intended for adults. Always seek professional guidance for supplementing children.
- **Kidney disease:** Impaired kidney function affects the metabolism and excretion of many nutrients, including potassium, magnesium, phosphorus, and fat-soluble vitamins. Always consult a nephrologist before supplementing.
- **Liver disease:** Fat-soluble vitamins and high-dose supplements are metabolized by the liver. Consult a practitioner before supplementing if you have compromised liver function.
- **Autoimmune conditions:** Immune-stimulating supplements such as elderberry, echinacea, and high-dose vitamin D should be used with caution and under supervision in autoimmune disease.

YOU DON'T NEED TO TAKE EVERYTHING...

Perhaps the most important page in this entire guide.

- If you have reached this point and feel overwhelmed by the sheer number of nutrients, compounds, and supplements outlined in these pages, that is completely understandable, and it is also entirely the wrong takeaway.
- This guide is a comprehensive reference, a resource to return to again and again as your health needs evolve, not a shopping list to action all at once.

Here is the truth about supplementation:


- Taking more is not always better. In fact, taking too many supplements at once makes it virtually impossible to know what is working, what is not, and what might be causing any new symptoms. The supplement industry is vast and profitable—and it is not in your best interest to spend a fortune on products your body may not need.

A smarter approach:

- Start with testing—before investing in a supplement protocol, work with a practitioner to identify your actual deficiencies and health priorities. A comprehensive blood panel including ferritin, vitamin D, B12, magnesium, zinc, thyroid function, and an inflammatory marker such as CRP is an excellent starting point
- Build a foundation first—the nutrients most people genuinely benefit from addressing first are vitamin D3 with K2, magnesium, omega-3, and a quality B complex. These four address the most widespread deficiencies and provide the broadest foundational support
- Add targeted supplements based on your individual needs—once your foundation is established, layer in targeted nutrients based on your specific symptoms, health goals, and test results
- Introduce one supplement at a time—allow 4–8 weeks with each new addition before assessing its effect and moving on. This is the only way to truly know what is making a difference for you
- Prioritize food first—no supplement protocol can outperform a nutrient-dense, diverse, whole food diet. The supplements in this guide are intended to complement exceptional nutrition—not replace it
- Cycle and reassess—nutritional needs change with seasons, life stages, stress levels, and health status. Reassess your protocol every 3–6 months and adjust accordingly.
- Work with a practitioner—the most effective and safest supplement protocols are personalized ones.

Remember: The goal of this guide is not to add complexity to your life—it is to give you the knowledge and confidence to make informed decisions about your health. True wellness is not found in a supplement cabinet. It is built through consistent nourishment, restorative sleep, joyful movement, stress resilience, and meaningful connection—with targeted nutritional support playing a powerful but supporting role in that larger picture.

Your health is your greatest asset. Invest in it wisely, one step at a time.



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