



ANTIOXIDANTS & PLANT COMPOUNDS

What They Do, Where to
Find Them, and How They
Support Whole-Body Health



INDEPENDENT[™]
MEDICAL ALLIANCE

TABLE OF CONTENTS

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



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.

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): CoQ10, omega-3, garlic, vitamins E and K, and nattokinase can all affect clotting. Always consult your doctor before supplementing if you are on anticoagulant therapy.
- Diabetes medications: Berberine, Alpha Lipoic Acid (ALA), cinnamon, insulin, chromium, and magnesium can lower blood sugar and may require medication adjustment under medical supervision.
- 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: CoQ10, omega-3, potassium, and magnesium can affect blood pressure. Monitor carefully and consult your prescribing doctor.
- Metformin: Significantly depletes vitamin CoQ10 and B12. 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.

Special populations requiring extra caution:

- Pregnancy and breastfeeding: Always work with a qualified practitioner before supplementing during pregnancy.
- Children and adolescents: Doses throughout this guide are intended for adults. Always seek professional guidance for supplementing children.
- Liver disease: High-dose supplements and fat-soluble vitamins 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.



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