White Paper

Minerals for Immune Health

cypress minerals
ROOTS OF LIFE

“The global immune health supplements market size is projected to grow from $25.92 billion in 2024 to $44.04 billion by 2032, at a CAGR of 6.9%”

Fortune Business Insights

Immune health exploded during the pandemic, and while growth has stabilized it’s still a hot area for the industry. In the US alone, Innova Market Insights found that 55% of consumers have taken action to maintain their immune health in the past year.

According to Fortune Business Insights, the immune health supplement market is expected to grow more than $44.1 billion by 2032. And, the 2024 SPINS Trend Predictions reported that the immune health supplements market will see a compound annual growth rate of 1.69% from 2024 to 2027. Immune health remains the top claim in US supplement launches, experiencing 12% CAGR growth over the past five years.

Interest in immune health solutions goes beyond supplements

Growth and interest is not limited to supplements -- 20% of US consumers think that boosting immunity is a desirable function that a food or beverage might offer.

Minerals are helping fuel the immune health market

Minerals like magnesium, zinc, copper, and selenium play crucial roles in supporting and maintaining a healthy immune system. This white paper dives into their role in immune health and formulation opportunities.

Minerals are essential for optimal function of the immune system

- Minerals are essential cofactors to thousands of enzymatic reactions in the human body.
- Cofactors are required for optimal enzyme activity.
- ↓ Cofactors - enzyme activity + ↓ coenzyme effects on enzyme activity.

Minerals are defense mechanisms

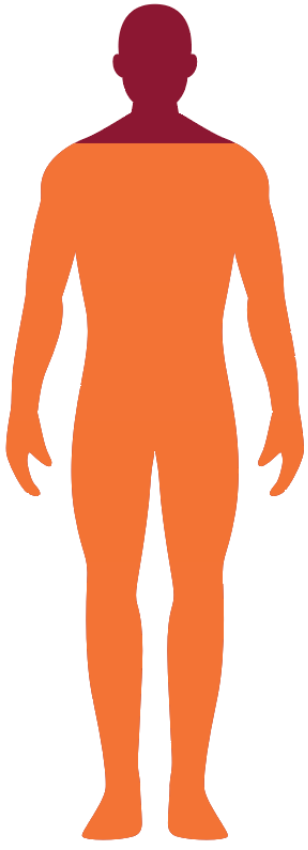
Minerals support defense mechanisms against pathogens in addition to the long-term balance of pro- and anti-inflammatory regulation.

Minerals are important for innate and adaptive immune defense

Minerals contribute to defense mechanisms against pathogens and the long-term balance of pro- and anti-inflammatory regulation.

4%
MINERALS

96%
CARBON
HYDROGEN
OXYGEN
NITROGEN



Minerals make up about 4% of the human body

There are 16 essential minerals in the human body.

- 7 macro minerals (over 100 mg/day)
- 9 micro minerals (<100 mg/day)

"Selenium is critical to healthy immunity. There are 25 genes in the human body that encode for selenal proteins, and most of them are actually involved in the immune system. "

~Jim Roufs, RD

Selenium

Selenium is an essential trace mineral that plays a pivotal role in maintaining immune health. As a component of selenoproteins, it contributes to antioxidant defense, supports immune cell function, and helps regulate inflammation. A well-balanced selenium intake is vital for protecting the body against oxidative stress, enhancing antiviral defenses, and maintaining overall immune resilience.

- There are 25 genes in the human body that encode for selenal proteins, and most of them are actually involved in the immune system.
- Immune Modulation: Selenium influences both innate and adaptive immune systems. It helps regulate inflammatory cytokine production and enhances the proliferation and activation of immune cells, such as T-cells and natural killer cells, thus promoting a balanced immune response.

- Reduction of Oxidative Stress: Selenium is a key component of glutathione peroxidases and thioredoxin reductases, enzymes that protect cells from damage caused by reactive oxygen species. By reducing oxidative stress, selenium contributes to maintaining cellular integrity and supporting immune responses.
- Selenium supports the function of various immune cells, particularly by enhancing T-cell proliferation and activity. Selenium deficiency can impair the immune system's ability to respond effectively to pathogens.
- Viral and bacterial infections often associated with nutritional deficiencies including a selenium deficiency.

Immune Health Formulation:
55 - 200 mcg of high selenium yeast

Bioavailable Form:
High selenium yeast

Magnesium

Magnesium is an essential cofactor for its own set of 300 plus enzymes in the human body. Magnesium supplementation has been shown to balance out immune response in that it can activate immune cells while at the same time modulating inflammation. And this is why studies have found an inverse relationship between low serum magnesium levels and increased inflammation. For example, increased CRP magnesium is also involved in glutathione processing.

50%
of the US population is not ingesting the daily value for magnesium

- Magnesium supplementation balances immune response (activates immune cells while modulating inflammation)
- Studies have found an inverse relationship between low serum magnesium concentrations + inflammation (e.g., increased CRP)
- Magnesium contributes to glutathione processing

Immune Health Formulation:
300 - 420 mg of elemental magnesium

Bioavailable Form:
Magnesium bisglycinate

"Low magnesium status is associated with decreased immune cell activity, increased oxidative stress, and increased inflammation, including increased levels of some inflammatory cytokines, such as interleukin-6."

~National Institutes of Health

~15%
of US population is estimated to have insufficient Zinc intake

Zinc

- Zinc is essential to maintenance and development of immune cells
- Zinc influences the formation, maturation, and function of T cells
- Zinc deficiency weakens both innate + adaptive (eg, Antibody (Ab) response) immunity
- Zinc bisglycinate considered gold-standard (eg, 43% > bioavailability than gluconate; Gandia et al, 2007)
- Zinc is an essential cofactor required by more than 300 enzymes

Immune Health Formulation:
15-30mg of elemental zinc

Bioavailable Form:
Zinc bisglycinate

Copper

- Copper plays a role in immune response modulation
- Deficiency in copper has been associated with reduced effectiveness of the humoral immune system
- Copper is involved in the production, maturation, and activity of white blood cells, which are crucial for defending the body against infections.

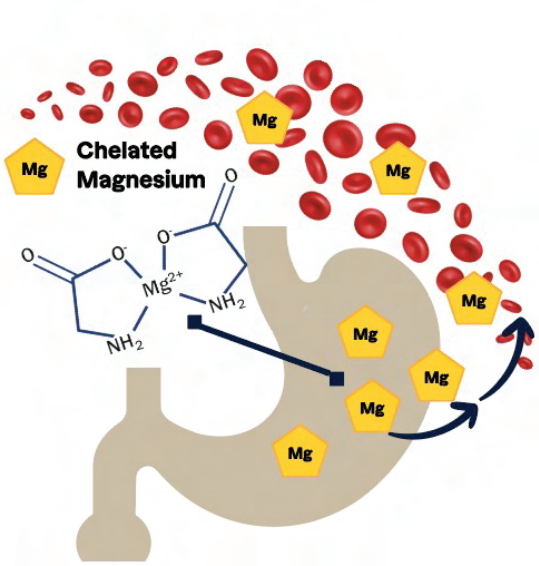
Copper levels decrease when zinc intake increases

Immune Health Formulation:
3-15 mg of elemental copper

Bioavailable Form:
Copper bisglycinate

FORM MATTERS

Resilient organic minerals are organically bound for optimal absorption, superior performance and powerful nutrition. They contribute to better-for-you immune health and other formulas, and typically cost less than $0.01/dose to incorprate.



For minerals, organic relates to the type of molecule the mineral is bound to–minerals need another molecule to help them get absorbed and utilized. They need the right "helper" to be stable and effective.

An organic mineral is a compound containing organic food-based yeasts and acids, such as amino acids and citric acid.

	Organic Minerals	Inorganic Minerals
Absorption	Superior absorption	Difficult to absorb
Bioavailability	High bioavailability; readily travels in the gut	Lower bioavailability; binds to other compounds and irritates the gut
Carbon	Yes	No
Electron Rotation	Clockwise, in sync with the body	Counter-clockwise, opposite the body
Form	Bound to organic molecules like proteins, amino acids, or carbohydrates	Bound to inorganic salts like oxides or sulfates
Stability	Breaks down more slowly, increasing stability	Breaks down more quickly, decreasing stability

Formulation Summary

Minerals are important additions to immune health formulas. We've listed a summary of the amount and forms for references

Mineral	Amount	Organic Forms
Selenium	55 to 200 mcg	Selenium yeast, selenomethionine
Magnesium	300 to 420 mg	Magnesium aspartate, magnesium bisglycinate, magnesium citrate, magnesium lactate
Zinc	15 to 30 mg	Zinc yeast, zinc bisglycinate
Copper	3 to 15 mg	Copper bisglycinate

Versatile Delivery Format Applications

Mintel reported in 2023 that tablets and capsules represented close to 60% of new supplement launches with immune health claims, but alternative formts are also gaining popularity. Nutrition Business Journal estimates that gummies account for nearly a quarter of all delivery system formats. Minerals are very versatile for formulators and work in a variety of immune health product delivery formats such as:


Capsules


Tablets


Gummies


Stick Packs


Powders


Liposomal


Functional Foods


Functional Beverages

The bottom line:

Adequate intake of minerals such as copper, magnesium, selenium and zinc, through diet or supplements is essential for maintaining a strong, balanced immune system. For optimized formulas, choose the organic form.

Since its inception in 1995, Cypress Minerals has been committed to providing resilient minerals that are highly bioavailable and easily absorbed by the body. Cypress Resilient Minerals™ are organically bound to ensure optimal absorption, superior performance, and powerful nutrition. By transforming minerals into their organic, live form of Resilient Minerals, Cypress ensures they deliver the essential building blocks for a strong and healthy foundation, promoting resilience and overall well-being.

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+1 (559) 229-7850
hello@cypressminerals.com
cypressMinerals.com