

BioFizz™ Immune

Antioxidant + bioflavonoid immune-supportive effervescent powder*



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BioFizz™ Immune is a delicious, orange-flavored, effervescent powder containing a comprehensive blend of immune-supportive nutrients.* Each 4-gram serving provides 1,000 mg vitamin C, along with targeted / clinically relevant amounts of the bioflavonoids quercetin and resveratrol, 50 mcg (2,000 IU) vitamin D, 100 mg vitamin E isomers (as delta and gamma tocotrienols), 50 mg geranylgeraniol (as GG-Gold®), and 20 mg zinc. These ingredients work synergistically to support immune function, especially during cold and flu season and during times of compromised immune health.*

Ingredient Highlights

Vitamin C (ascorbic acid) is an essential nutrient that must be supplied by the diet or supplementation. The body requires adequate amounts of vitamin C for immune function, bone maintenance, collagen crosslinking, enzymatic reactions, central nervous system function, and healthy inflammatory responses, along with a broad range of biological functions in order to maintain physiologic homeostasis.¹ In regards to maintaining healthy immune function, Vitamin C plays multiple key roles, including:²

- Maintaining structural and functional integrity of mucosal cells in innate barriers such as the skin and respiratory tract
- Differentiation, proliferation, functioning, and movement of neutrophils, monocytes, and phagocytes (innate immune cells)
- Maintaining intracellular redox homeostasis, modulating cytokine production, and regenerating other critical antioxidants
- Differentiation, proliferation, and normal functioning of cytotoxic T cells
- Promoting antibody production by promoting lymphocyte proliferation

White blood cells have 10 times higher vitamin C concentrations than plasma.³ Vitamin C supports the integrity of epithelial barriers via promoting collagen synthesis and protecting cell membranes from free radical damage.² It also helps maintain and enhance natural killer (NK) cell activity and chemotaxis, phagocytosis and ROS generation, microbial killing, and macrophage activity to clear out debris at the site of infection.²

Research shows vitamin C supplementation helps alleviate and shorten upper respiratory tract infections (URTI) such as the common cold, and decreases risk of infection when taken preventatively.⁴ Studies showed that vitamin C inhibited the virulence of herpes simplex virus -1, influenza virus type A (IAV), and poliovirus, and reduced lung inflammation.⁵ A meta-analysis showed vitamin C supplementation to significantly reduce the risk of pneumonia, and in older patients, reduce severity and risk of death.⁴ Compared to healthy controls with zero cases of deficiency, 62% of patients with community-acquired pneumonia had hypovitaminosis C and 22% were overtly deficient.⁶ The results also exhibited significantly elevated protein carbonyl (a marker of oxidative stress) compared with controls, suggesting a higher intake of vitamin C may be beneficial to restore blood and tissue levels during illness and infection when levels are decreased and oxidative stress is increased.^{3,4,6}

Quercetin, also known as the "king of the flavonoids," is considered to be among the top plant-based polyphenolic compounds due to its powerful antioxidant properties and its ability to support a healthy inflammatory response in the body. Quercetin is the most abundant bioflavonoid in the diet; it is naturally found in many fruits, vegetables, roots, and herbs recognized for their health benefits, such as apples, red onions, dark grapes and berries, cruciferous vegetables, and many others.⁷

Along with its ability to attenuate oxidative damage, quercetin possesses various antiviral properties and may be a promising prophylaxis for infections, such as the common cold and other respiratory viruses.^{7,8} Quercetin has been shown in research to inhibit infectivity and replication of viruses and reduce resistance to antiviral medications.⁷ Moreover, it reduces virus-related hyper-responsive/inflammation (aka "cytokine storm") of the immune system by preventing pro-inflammatory gene expression and protein secretion and by increasing PPAR- γ activity, thus antagonizing NF- κ B and TNF- α .⁷ Quercetin was also shown to modulate heat shock protein expression, thereby protecting against IAV and H1N1.^{7,9} Daily quercetin supplementation decreased URTI in cyclists during a two-week period of intensified exercise compared to the placebo.⁷ Animal models given quercetin after being induced with H1N1 influenza virus had significantly lower mortality and morbidity than the placebo due to the restoration of endogenous lung antioxidants (e.g., SOD, catalase, GSSH) that were dropped by 45-65% by the virus, and lowered the risk of bacterial infections, which is one of the primary causes of influenza-related deaths.^{7,10} Another study demonstrated quercetin's inhibitory action on IAV entry.¹¹ Quercetin was also shown to restore corticosteroid sensitivity in patients with chronic obstructive pulmonary disease (COPD).⁷

Resveratrol is another plant-derived phenolic antioxidant that can decrease viral proteins, infection, and replication; it has been shown to be an effective inhibitor of some viruses *in vitro*.¹²⁻¹⁴ In human stem cells, resveratrol was shown to modulate NLRP3 inflammasome, reducing IL-1 β expression.¹⁵

Vitamin E Isomers (as delta and gamma tocotrienols) (T3) supplementation may help enhance host immune system health and increase cellular defense, especially during cold season, as T3 helps reduce oxidative stress and inflammation.^{9,10,16,17} In a virus-induced animal model, quercetin was unable to replenish lung vitamin E, therefore warranting delta-T3 supplementation (as an adjunct to quercetin and resveratrol) to restore the diminished production of lung antioxidants and reduce the excessive generation of ROS and curb inflammation.^{10,18} In an animal model, gamma and delta-T3 were effective in mitigating asthma and non-communicable COPD, which are exacerbated by respiratory viruses by 40-60%.¹⁹ Compared to controls, mice given delta-T3 and tocotrienol-rich fraction showed enhanced vaccine response to tetanus toxoid immunization and promotion of cell-mediated immune response.¹⁷

Evidence suggests dietary and supplemental tocotrienols may be helpful in mitigating COVID-19-related pathologies and comorbidities, such as the increased thrombosis phenomena observed in the novel coronavirus. Supplementation may help attenuate the increased incidence of plaque ruptures leading to cardiovascular events, complications related to metabolic syndrome, and aging (e.g., obesity, hyperlipidemia, diabetes), while offering various anti-inflammatory effects.²⁰⁻²³ T3 has been shown to have direct anti-thrombotic effects, reducing platelet aggregation as well as thromboxane B4 and platelet factor 4 in humans and animal models.²⁴⁻²⁷ T3 was also shown to reduce activation of human endothelial cells,²⁸ inhibit monocyte adhesion,²⁶ and increase arterial plaque stabilization.^{29,30} T3 reduced inflammatory markers associated with aging²⁶ such as CRP, MMPs, IL-6,^{22,23,29-31} and decreased monocyte activation through reduction of COX2 and iNOS production and NF- κ B expression.³²

Geranylgeraniol (GG) has been shown to play a role in viral replication. One of its metabolites, geranylgeranylacetone (GGA), demonstrated the ability to inhibit influenza virus in animal models as it is a potent inducer of heat shock proteins which enhance antiviral factors.³³ In human hepatoma cells, GGA upregulated antiviral gene expression.³⁴

Vitamin D (as cholecalciferol) and its metabolites significantly influence immune health and help reduce infection risk by promoting macrophage activity, regulating proinflammatory cytokine production, and enhancing antigen presentation, as well as modulating antimicrobial protein synthesis that directly kills pathogens.⁴ Vitamin D deficiency has been shown to increase the risk of acute respiratory tract infection (ARI); 2,000 IU/day vitamin D supplementation was shown to help reduce the risk of ARI in adults and children.⁴ Results from a systematic review and meta-analysis revealed that daily or weekly vitamin D supplementation protected against ARI by 25% in those with baseline 25(OH)D levels \geq 25 nmol/L and by 70% in subjects with levels <25 nmol/L.⁴

A science report found that vitamin D levels were significantly lower in patients who tested positive for SARS-CoV-2 compared with those who tested negative.³⁵ Recent evidence shows that rapidly raising 25(OH)D levels above 40-60 ng/mL could help reduce the risk of influenza and other viral infections.³⁶

Zinc (as zinc bisglycinate chelate) helps develop and maintain immune cells in both the innate and adaptive immune systems, its status a critical factor in antiviral immune response.^{4,37} Zinc is a vital part of viral enzymes, proteases and polymerases.³⁷ Inadequate zinc levels weaken host defense as it disrupts lymphocyte formation and maturation and intracellular cytokine communication.⁴ Zinc-deficient populations are most at risk of acquiring viral infections; deficiencies were shown to increase respiratory and diarrheal morbidity, especially in children as it greatly influences immune health.^{4,37} Both human and animal *in vivo* studies have shown zinc to significantly lower rates of various viral infections and disease burden.³⁷

Supplement Facts

Serving Size 4 grams (approx. one scoop)
Servings Per Container 30

Amount Per Serving	% Daily Value	Amount Per Serving	% Daily Value
Calories	15	Quercetin	500 mg *
Total Carbohydrate	4 g 1%**	Trans-Resveratrol (<i>Polygonum cuspidatum</i>)(root)	100 mg *
Dietary Fiber	less than 1 g <4%**	Vitamin E Isomers	100 mg *
Vitamin C (as Ascorbic Acid)	1000 mg 1111%	(as DeltaGold® delta and gamma tocotrienols)	
Vitamin D (as Cholecalciferol)	50 mcg (2000 IU) 250%	Trans-Geranylgeraniol (as GG-Gold™)	50 mg *
Zinc (as Zinc Bisglycinate Chelate)	20 mg 182%		
Potassium	130 mg 3%		

**Percent Daily Values are based on a 2,000 calorie diet.
*Daily Value not established.

Other Ingredients: Partially hydrolyzed guar gum, natural flavor, potassium bicarbonate, citric acid, luo han guo extract (fruit).

Recommended Use:

- Mix 4 grams (approx. one scoop) in 8 ounces of water, or as directed by your health care practitioner.

For a list of references cited in this document, please visit:

<https://www.designsforhealth.com/techsheet-references/biofizz-immune-references.pdf>

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

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*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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