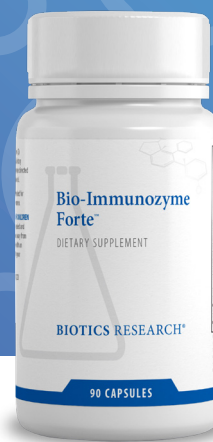


Bio-Immunozyne Forte™

Comprehensive Immune-Focused Multivitamin



Bio-Immunozyne Forte™:

90 caps (#6300)

180 caps (#6301)

Bio-Immunozyne Forte™ is a unique, broad-spectrum multivitamin designed to specifically support normal, healthy immune function; it provides a wide array of vitamin, mineral, botanical, amino acid and organ/glandular-specific support.*

The Immune System

The two arms of the immune system—humoral and cell-mediated immunity—work together as an integrated defensive system. Normally, antibodies are produced in response to foreign material (acquired immunity). Immune complexes form between antibodies and antigens and are scavenged from the circulation or mucosal surfaces. Cell-mediated immunity relies on T and B lymphocytes, mast cells, macrophages, and other immune cells. T-cells regulate other defensive cells, including macrophages and killer cells. Cells of the immune system turn over rapidly; hence, their nutrient requirements are high.

In addition, phagocytic cells generate free radicals and other reactive species to attack invaders. These oxidants contribute to the oxidative burden of organs, which, if unchecked by the body's antioxidant defenses, can damage membrane lipids, diminish T-cell function, and injure mucosal cells. Membranes damaged by lipid peroxidation may offer less resistance to infection. The production of radicals from endogenous and exogenous sources consumes antioxidants. Consequently, a variety of nutrients and factors support immune function.

Vitamins

Vitamin A has long been known to support mucosal cell surfaces and the immune system; it helps maintain the integrity of lymphatic tissues, antibody levels (especially sIgA), and responses of cellular immunity to challenge by exogenous stimulatory substances.¹ The nutrient's ability to support mucosal barriers and regulate immune cell development makes it a cornerstone of comprehensive immune support. However, the effects are selective. It appears that a metabolite of retinol regulates lymphocytes.² In vitamin A deficient rates, phagocytic activity of circulating polymorphonuclear lymphocytes was shown to decline.³ The integrity of epithelial cells and production of protective agents, such as mucus secretions, are essential for healthy mucosa. In vitamin A deficiency, the mucosa, glands and ducts are susceptible to disease. Vitamin A

requirements appear to be only partially met by the consumption of dark, green, leafy vegetables.⁴

Vitamin C scavenges free radicals and is essential for the function of many systems, including the immune system. Vitamin C is required for eicosanoids that regulate the body's natural inflammatory response and it combats the effects of oxidative stress. Vitamin C is a major antioxidant in the blood and it works together with vitamin E. For example, supplemental vitamin C and vitamin E decreased the production of reactive oxygen species and lipid peroxidation in patients with myocardial infarction.⁴ During periods of stress, urinary excretion of vitamin C increased.⁵ Vitamin C supplementation showed an increase in natural killer cell activity, enhanced neutrophil migration, improved phagocytosis, and robust lymphocyte proliferation.⁶

Vitamin E acts as a sophisticated immunomodulator. The nutrient demonstrates remarkable capacity to regulate T-cell mediated immune responses, with potential to mitigate inflammatory markers.⁷ This nuanced approach to immune support represents a quantum leap in understanding micronutrient interactions with immune function.

B vitamin deficiency is characterized by reduced phagocytic activity. Vitamins B2, B6 and pantothenic acid have specifically shown an ability to enhance antibody production. **Vitamin B6** as pyridoxal-5-phosphate, the coenzyme form of the vitamin, is required by transaminases and amino acid decarboxylases in the breakdown of amino acids. As such, vitamin B6 plays a critical role in rapidly dividing cell types. Human studies, as well as animal experiments, link vitamin B6 deficiency to reduced lymphocyte differentiation, reduced delayed hypersensitivity responses and impaired antibody production.⁸ Other research suggests that suboptimal vitamin B6 intake may play a role in a defective immune response in hemodialysis patients.⁹ Pantothenate deficiencies are associated with infections of the upper respiratory tract and pharyngitis.¹⁰ Pantothenic acid is necessary for immunoglobulin production. Proper adrenal function requires pantothenic acid, ascorbic acid and zinc.¹¹ These water-soluble nutrients are necessary during stress.



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Co-Factors

Mixed natural carotenoids, isolated from plants, include alpha and beta carotenes and oxy-carotenoids, such as zeaxanthin, lutein and cryptoxanthin. Carotenoids complement vitamin E as lipid-soluble antioxidants. The natural mixed carotenoids are better absorbed and are more effective antioxidants than synthetic beta carotene *in vivo*.¹² By acting as antioxidants, carotenoids can limit lipid peroxidation.¹³ Beta-carotene has long been known to have a protective impact on the immune system. Healthy male nonsmokers supplemented with beta carotene revealed increased CD4-CD5 ratio after 9 months compared to controls who had taken a placebo.¹⁴ After supplementation with beta carotene, there were significant increases in monocytes expressing major histocompatibility complex molecules, adhesion molecules and TNF secretion in a similar group of subjects.¹⁵ Beta-carotene works as a potent immunomodulator, supporting natural killer cell activity and providing critical antioxidant protective mechanisms, further enhancing the body's immune capabilities.¹⁶

Coenzyme Q10 (CoQ10) functions both as an essential mitochondrial electron carrier for energy production and as a lipid-soluble antioxidant.¹⁷ Dietary intake of CoQ10 has been shown to reduce plasma levels of lipid peroxides.¹⁸ Although CoQ10 can be synthesized by the body, the levels in membranes of mitochondrial and other structures may be lower than needed for optimal function. Thymic CoQ10 levels declined in mice with increasing age. CoQ10 plays a critical role in supporting mitochondrial function within immune cells and addresses age-related immune decline, offering a novel approach to maintaining immune resilience.¹⁹ CoQ10 together with vitamin B6 has been shown to support the production of T4-lymphocytes and immunoglobulins.²⁰

Minerals

Selenium is a trace mineral that is converted to selenocysteine, which plays a catalytic role in glutathione peroxidase production. In this sense, selenium can be considered an antioxidant. Selenium has a major impact on the immune system. Selenium's immunoprotective potential reveals the mineral's complex role in supporting selenoprotein expression within immune cells, providing antioxidant protection and supporting the natural inflammatory response.²¹ Glutathione peroxidase activity was significantly higher in younger people than in elderly subjects.²²

Copper, Manganese and Zinc: Superoxide dismutase (SOD) is the only family of enzymes that specifically inactivate free radicals, namely, the superoxide radical. Excessive superoxide production, as well as excessive amounts of other oxidants, is linked to chronic oxidative stress. Mitochondrial SOD requires manganese as an essential cofactor, while the cytoplasmic form of SOD requires both copper and zinc. Manganese SOD and copper-zinc SOD activities in lymphocytes and neutrophils were not inducible by cytokines in elderly subjects, although these activities were readily inducible in non-aged subjects.²² These results suggested an age-related alteration in the regulation of these defensive enzymes. Erythrocyte copper-zinc SOD activity tends to reflect copper status, which has been used in laboratory assessment.²³ In addition, supplementation with superoxide dismutase of Biotics Research's vegetable culture may increase erythrocyte superoxide dismutase activity *in vivo*.²⁴

Zinc plays an important role in maintaining the health of the immune system. It is a required cofactor for DNA polymerase and RNA polymerase, essential for cell proliferation. Rapidly dividing cells, including mucosal cells and immune cells, require zinc. Zinc deficiency leads to atrophy of lymphatic tissues, decreased skin delayed hypersensitivity response, impaired phagocytes, decreased T-cell function and lowered IgA and decreased thymic hormone activity.²⁵ Zinc supports granulocyte chemotaxis *in vitro*.²⁶ Zinc also supports both innate and adaptive immune responses, acting as a key regulator of cellular immune mechanisms.²⁷

Bio-Immunozyne Forte™ contains bovine neonatal thymus, spleen, liver, pancreas, in addition to bovine parotid gland, lymphatic and placental tissues. These glandular preparations are processed to maintain nutrients, enzymes and associated factors. Biotics Research uses bovine neonatal tissues where possible. Neonatal thymus tissue provides optimal concentrations of immune-supporting factors, including thymulin, a zinc-containing peptide that can partially restore T-cell function. The effects of preparations of thymic factors after oral administration have been studied.²⁸ The thymus gland serves as the primary organ for T-lymphocyte development and immune system education, with research demonstrating its key role in promoting and directing the development of multiple T lymphocyte types with specific functional roles in immune responses.²⁹

The spleen serves critical functions in immune surveillance, blood filtration, and white blood cell production with unique bioactive peptides including tuftsin and splenopentin that enhance immune modulation and macrophage function.³⁰ Healthy endocrine pancreatic glands are also important. They secrete glucagon, insulin and somatostatin. Somatostatin regulates growth hormone secretion. Healthy adrenal glands support normal immune function. They produce hormones that adapt the body to stress, including epinephrine and glucocorticoids. Cortisol stabilizes mast cells to inhibit inflammation. It also decreased capillary permeability to limit neutrophil infiltration and reduce phagocytosis. Laboratory analysis of Biotics Research's adrenal glandulars did not detect the presence of steroid hormones. Salivary glands produce factors that can enhance lymphocyte proliferation and support thymus, spleen and lymph nodes in animal models.³¹ The major salivary glands also produce antimicrobial factors.

Neonatal liver extract provides concentrated bioavailable nutrients including vitamin A, B12, folate, iron, zinc, and copper, essential for metabolic support of immune function. The liver's role as the body's primary detoxification organ makes it particularly valuable for supporting overall immune resilience.³² Pancreatic extract contributes essential proteolytic enzymes including lipase, protease, trypsin, and amylase, which are crucial for nutrient absorption and immune function support.

Lactobacillus

The microbiome plays an extremely important role in immune function. Probiotics, particularly Lactobacillus, help support critical microbiome-immune system communication.³³

Lactobacillus acidophilus, a member of the normal gut flora, produces vitamins, stimulates the immune system, and produces factors that inhibit growth of less desirable organisms. By occupying an ecological niche in the intestine, they further limit the growth of opportunistic organisms.³⁴ Lactobacillus can be depleted by an imbalanced diet and the long term usage of broad-spectrum antibiotics. The effectiveness of supplemental Lactobacillus acidophilus in normalizing GI function has been demonstrated.³⁵ DDS-1 strain developed at the University of Nebraska, has proven to be a superior strain in terms of its compatibility with the human GI tract and its stability. Therefore, the DDS-1 strain is used in Biotics Research supplements.

Essential Amino Acids

L-Lysine serves as an essential amino acid critical for antibody production and immune cell proliferation. Research demonstrates that lysine works by upregulating the immune system, particularly enhancing IgG antibody levels when combined with vitamin C.³⁶ Studies have shown that lysine supplementation supports immune system function through enhanced antibody response, anti-viral properties, and improved stress resilience.³⁶

Citrus Bioflavonoids represent potent immunomodulatory compounds that enhance vitamin C absorption and provide comprehensive support for a healthy inflammatory response. Research has documented their role in enhancing immune barrier function and immune cell support, while reducing pro-inflammatory cytokine production including IL-6 and TNF-α.³⁷ The bioflavonoids provided have been shown to improve antioxidant status and cellular protection while demonstrating synergistic vitamin C enhancement and bioavailability.³⁷

Echinacea angustifolia serves as a comprehensive immunomodulator affecting both innate and adaptive immune responses. The plant contains active compounds including caffeic acid, alkamides, and phenolic acids that contribute to its immune-supporting properties. Clinical research has demonstrated enhanced antibody response and immune cell proliferation, increased interferon-γ production with reduced inflammatory cytokines, and improved natural killer cell activity.³⁸

Summary

Bio-Immunozyne Forte™ moves beyond the traditional multivitamin concept and is a sophisticated formula designed to support the body's natural defensive mechanisms through comprehensive micronutrient support.

Healthcare professionals can leverage this formulation as a strategic approach to supporting patient immune resilience, recognizing the critical role of targeted nutritional intervention in maintaining optimal health.



Bio-Immunozyne Forte™:
90 caps (#6300)
180 caps (#6301)

Supplement Facts					
Serving Size: 2 Capsules					
Servings Per Container: 45					
	Amount Per Serving	% Daily Value			
Vitamin A (as acetate and natural mixed carotenoids) (IU ratio 3:1)	2,070 mcg RAE	230%	Neonatal Spleen (bovine)	60 mg	*
Vitamin C (as calcium and magnesium ascorbates)	200 mg	222%	Neonatal Liver (bovine)	60 mg	*
Vitamin E (as d-alpha tocopheryl acetate)	20 mg	133%	Neonatal Pancreas (bovine)	60 mg	*
Thiamin (B1) (as cocarboxylase chloride)	10 mg	833%	Parotid (bovine)	40 mg	*
Riboflavin (B2) (as riboflavin-5-phosphate)	15 mg	1,154%	Placenta (bovine)	20 mg	*
Niacin (as niacinamide)	20 mg	125%	Trypsin & Alpha Chymotrypsin (porcine)	25 mg	*
Vitamin B6 (as pyridoxal-5-phosphate)	15 mg	882%	L-Lysine HCl	100 mg	*
Pantothenic Acid (as calcium pantothenate)	25 mg	500%	Coenzyme Q10 (naturally derived, emulsified)	1 mg	*
Zinc (as zinc gluconate and zinc citrate)	30 mg	273%	Citrus Bioflavonoids (from citrus fruit)	50 mg	*
Selenium (from vegetable culture† and selenomethionine)	50 mcg	91%	Superoxide Dismutase (from vegetable culture †)	60 mcg	*
Copper (as copper gluconate)	1 mg	111%	Catalase (from vegetable culture †)	60 mcg	*
Manganese (as manganese gluconate)	2 mg	87%	Proprietary Blend	120 mg	
Adrenal Complex Concentrate††	20 mg	*	Echinacea angustifolia (root)*, Neonatal Lymph Tissue (bovine)*, Cayenne Pepper (Capsicum annum) (fruit)*, Chlorophyllins*, Ørganik-15™††, Lactobacillus acidophilus*		
Neonatal Thymus (bovine)	60 mg	*			
* Daily Value not established					

Other ingredients: Capsule shell (gelatin and water), food glaze, and stearic acid (vegetable source).
† Specially grown, biologically active vegetable culture (from organic peas, lentils and/or chickpeas) containing **Phytochemically Bound Trace Elements™**, methyl compounds and/or naturally associated phytochemicals including polyphenolic compounds with SOD and catalase, dehydrated at low temperature to preserve associated enzyme factors.
†† A unique proprietary complex of neonatal bovine tissue and porcine tissue concentrates.
Contains an ultra-trace amount (<0.001 ppm) of milk constituents which are used in the fermentation of probiotic ingredients.

Recommendation:

Two (2) capsules each day as a dietary supplement or as otherwise directed by a healthcare professional.

Caution:

Not recommended for pregnant or lactating women.

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