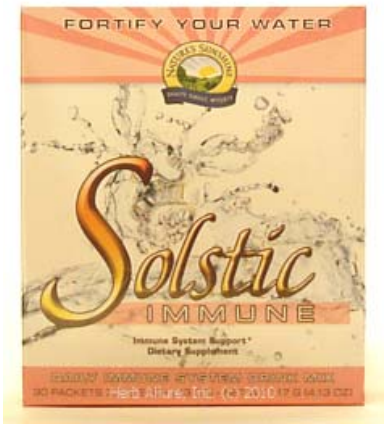


# Solstic Immune

Stock #6530-6 (30 packets)

Solstic Immune is a convenient daily drink packet that provides important nutrients for maintaining immune system health. Solstic Immune contains a synergistic blend of vitamins, herbs and antioxidant-rich nutrients that have been shown to enhance immune function and increase the body's resistance to infections, such as the common cold and flu. Solstic Immune contains:

**Vitamin C** (Ascorbic acid) is essential for stimulating the immune system, as research shows that levels of vitamin C in plasma and leukocytes (the scientific term for white blood cells) quickly decrease during infections and as a result of stress, thus reducing the body's resistance to certain pathogens (disease-causing organisms). Numerous studies have shown that supplementation with vitamin C enhances immune system function, including antimicrobial and natural killer (NK) cell activity, as well as the proliferation of lymphocytes (a type of white blood cell). In addition, research indicates that vitamin C inhibits the multiplication of viruses, including influenza. Furthermore, a review of 29 controlled trials found that vitamin C does appear to shorten the duration and reduce the severity of the common cold.[1-6]

**Vitamin D** (D3, Cholecalciferol) is recognized for its profound effects on human immune function. Vitamin D acts as an immune system modulator, increasing the activity of macrophages (white blood cells that destroy bacteria) and providing anti-inflammatory effects. Vitamin D also dramatically stimulates the production of antimicrobial peptides (AMP) that play a crucial role in protecting the respiratory tract against infection and inhibit the function of the influenza virus. Recent research has discovered considerable evidence that influenza epidemics, and possibly even the common cold, occur as a result of seasonal deficiencies in AMP, secondary to seasonal deficiencies in vitamin D. Likewise, epidemiologic studies suggest a correlation between vitamin D concentrations and the incidence of respiratory infections, including influenza. A prospective cohort study revealed that healthy individuals with higher concentrations of vitamin D demonstrated a significant two-fold reduction in the risk of developing acute respiratory tract infections, compared to those with lower levels of vitamin D. Higher vitamin D concentrations were also associated with a marked decrease in the percentages of days ill. Furthermore, results from a 3-year randomized, controlled trial found that women taking vitamin D were 3 times less likely to report cold and flu symptoms compared to those given a placebo. During the last year of the trial, higher dose vitamin D supplementation (2,000 IU daily) virtually eliminated all reports of colds and flu among study participants.[7-11]

**Zinc** (Zinc acetate) - The importance of zinc in resistance to infections by bacteria, virus and fungi is crucial because of its pivotal role in the efficient functioning of the entire immune system. Zinc is essential for thymus gland function and the production of thymic hormones that regulate the body's defense mechanisms. Zinc is also crucial for maintaining cell-mediated immunity, phagocytosis (a process that stimulates the immune response against viral infection), and NK cell activity. Various studies have confirmed the benefits of zinc supplementation on infectious diseases such as acute lower respiratory tract infection, pneumonia, tuberculosis, and the common cold. In addition, zinc supplementation has been shown to reduce the occurrence of and increase the survival rate following infection in the elderly. Furthermore, randomized controlled trials have found that adequate intakes of zinc and vitamin C can reduce the symptoms and shorten the duration ofthe common cold.[4,6,12-15]

**Potassium** (Potassium bicarbonate) is an essential mineral required for healthy energy metabolism and cellular functions, as well as for preserving proper alkalinity of body fluids. Potassium also assists with muscle contraction and nervous system activity, regulates fluid and mineral balance, and works in conjunction with sodium to normalize the heartbeat.[1,12,16,17]

**Elderberry** (*Sambucus nigra*) is primarily used as an antiviral agent to improve immunity against colds and influenza. Research suggests that taking elderberry at the first sign of a cold or flu may cut recovery time in half. For example, a randomized, double-blind, placebo-controlled study of patients with influenza A and B infections found that elderberry relieved flu-like symptoms an average of 4 days earlier compared to placebo. In addition, a recent study found that elderberry flavonoids inhibited human influenza A (H1N1) infection in vitro—the inhibitory action was likened to the anti-influenza activities of the antiviral drugs oseltamivir (Tamiflu) and amantadine. Furthermore, the German Commission E has approved elderberry for the treatment of colds and fevers.[6,18-23]

**Beta-glucans** (extracted from *Saccharomyces cerevisiae*) are naturally occurring polysaccharides derived from algae, barley, mushrooms, oats and baker's yeast (*Saccharomyces cerevisiae*). Beta-glucans are noted for their immune-modulating activities associated with increased resistance to bacterial, viral and parasitic infections. Beta-glucans stimulate the immune system, modulating both humoral and cellular immunity. For example, research

shows that beta-glucans enhance macrophage and NK cell activities. Beta-glucans also facilitate the transmission of cellular information among the macrophages, T-cells, B-cells, antibodies, and interferons (substances that fight viral infection by inhibiting viral growth) and interleukins (substances that regulate immune system function), thus enhancing overall immune response.[24-31]

**Echinacea** (*Echinacea purpurea*) is notably the most recognized herbal supplement for preventing and treating colds and flu. Echinacea demonstrates antibacterial, antiviral and immunomodulating properties that have been shown to enhance innate and adaptive immune functions. Echinacea also helps reduce disease-producing waste material in the lymphatic system by stimulating macrophage activity. Clinical studies support the use of echinacea for preventing and treating colds, flus and upper respiratory infections, as well as increasing general immune system function. For example, a meta-analysis of 14 studies found that echinacea reduced the incidence of the common cold by 58% and the duration of cold symptoms by 1.4 days.[6,12,18,32-37]

**Arabinogalactan** (extracted from *Larix spp*.) is a polysaccharide found in echinacea and in concentrated amounts in the Western larch tree (*Larix spp*.). Arabinogalactan is believed to be the substance primarily responsible for echinacea's effective immune-stimulating properties. Arabinogalactan enhances NK cell activity and stimulates macrophage production of interleukin-1 (an immune system hormone that stimulates T-cell function) and interferon-beta 2 (a substance that fights viral infection). Such effects suggest that arabinogalactan may be beneficial in supporting the body's natural defenses in the prevention and treatment of colds and influenza. Furthermore, combining arabinogalactan with antioxidants such as vitamin C may enhance its efficacy.[38-44]

**Blueberry fruit** (*Vaccinium corymbosum*) is a rich source of powerful antioxidant compounds, including anthocyanins and vitamin C. Blueberries demonstrate cardiovascular protection and antibacterial, anti-cancer, anti-diabetic and vision-enhancing properties. Blueberries have also been shown to enhance cellular immune function in animal studies.[45-49]

**Red raspberry fruit** (*Rubus idaeus*) is a rich source of powerful antioxidant compounds, including anthocyanins and vitamin C. Among fruits commonly consumed in the U.S., raspberries and blueberries rank among the highest in cellular antioxidant activity. Raspberries also demonstrate antibacterial activity.[50-52]

**Cranberry fruit** (*Vaccinium macrocarpon*) provides potent antioxidant, antibacterial and anti-inflammatory activity. Consumption of cranberries has been linked to improved urinary tract health and may also protect against cardiovascular and other degenerative diseases and infections.[53-57]

**Blackberry fruit** (*Rubus fruticosus*) contains powerful antioxidant compounds known as anthocyanins. Blackberry anthocyanins have demonstrated multiple protective effects against experimentally-induced lung inflammation in animal studies. Blackberry juice has also been shown to increase plasma ascorbic acid (vitamin C) levels, as well as plasma antioxidant capacity in humans.[58-59]

**Korean ginseng** (*Panax ginseng*) has been shown to improve the immune response, in part, by stimulating the production of white blood cells and interferon and by enhancing phagocytosis. The active constituents in Korean ginseng include acidic polysaccharides, which demonstrate multiple immunomodulating effects. Animal research has confirmed that treatment with Korean ginseng polysaccharides stimulates humoral and cellular immune factors to increase resistance against infection. Furthermore, a two-year clinical observation of Japanese heart patients found that Korean ginseng significantly reduced the incidence of common cold and flu symptoms, including fever, headache, chills, pain in the joints and/or muscles, nasal discharge, cough and sore throat.[60-68]

**Short-chain fructooligosaccharides** (scFOS) are naturally-occurring simple carbohydrates that are neither digested nor absorbed by humans. Instead, scFOS suppress the growth of potentially harmful pathogens (disease-causing organisms) in the colon. ScFOS also promote the growth of bifidobacteria—one of several beneficial strains of colonic bacteria that facilitate immune system function. In addition, ScFOS positively influence intestinal immunomodulation by stimulating the development of the gut-associated lymphoid tissue (GALT), which plays an essential role in cellular nutrition, energy metabolism and immunity.[69-74]

References:

[1]Dunne, L.J. *Nutrition Almanac, 3rd Ed*. NY, NY: McGraw-Hill Publishing Co.; 1990.

[2]Deruelle, F., Baron, B. "Vitamin C: is supplementation necessary for optimal health?" *Journal of Alternative and Complementary Medicine*; 2008, 14(10):1291-1298.

[3]Ströhle, A., Hahn, A. [Vitamin C and immune function]. *Medizinische Monatsschrift für Pharmazeuten*; 2009, 32(2):49-54.

[4]Wintergerst, E.S., et. al. "Immune-enhancing role of vitamin C and zinc and effect on clinical conditions." *Annals of Nutrition & Metabolism*; 2006, 50(2):85-94.

[5]Furuya, A., et. al. "Antiviral effects of ascorbic and dehydroascorbic acids in vitro." *International Journal of Molecular Medicine*; 2008, 22(4):541-545.
[6]Roxas, M., Jurenka, J. "Colds and influenza: a review of diagnosis and conventional, botanical, and nutritional considerations." *Alternative Medicine Review*; 2007, 12(1):25-48.
[7]Adams, J.S., Hewison, M. "Unexpected actions of vitamin D: new perspectives on the regulation of innate and adaptive immunity." *Nature Clinical Practice. Endocrinology & Metabolism*; 2008, 4(2):80-90.
[8]Cannell, J.J., et. al. "On the epidemiology of influenza." *Virology Journal*; 2008, 25;5(1):29.
[9]Cannell, J.J., Hollis, B.W. "Use of vitamin D in clinical practice." *Alternative Medicine Review*; 2008, 13(1):6-20.
[10]Alitalo, A. [Human anti-infectious defence may be enhanced by vitamin D]. *Duodecim*; 2010, 126(10):1127-1134.
[11]Sabetta, J.R., et. al. "Serum 25-hydroxyvitamin d and the incidence of acute viral respiratory tract infections in healthy adults." *PLoS One*; 2010, 5(6):e11088.
[12]Pizzorno, J. & Murray, M. *Textbook of Natural Medicine, 2nd Ed*. London: Churchill Livingstone, 1999.
[13]Prasad, A.S. "Zinc in human health: effect of zinc on immune cells." *Molecular Medicine*; 2008, 14(5-6):353-357.
[14]Overbeck, S., et. al. "Modulating the immune response by oral zinc supplementation: a single approach for multiple diseases." *Archivum Immunologiae et Therapiae Experimentalis*; 2008, 56(1):15-30.
[15]Prasad, A.S. "Zinc: role in immunity, oxidative stress and chronic inflammation." *Current Opinion in Clinical Nutrition and Metabolic Care*; 2009, 12(6):646-52.
[16]"FDA Grants Health Claim to Potassium." *Nutrition Science News*; January 2001.
[17]Lieberman PhD, S. & Bruning, N. *The Real Vitamin & Mineral Book, 2nd Ed*. Avery; 1997.
[18]*Herbal Medicine: Expanded Commission E Monographs*. Newton, MA: Integrative Medicine Comm., 2000.
[19]Lininger DC, S., et al. *The Natural Pharmacy, 2nd Ed*. Rocklin, CA: Prima Health, 1999.
[20]Zakay-Rones, Z., et. al. "Randomized study of the efficacy and safety of oral elderberry extract in the treatment of influenza A and B virus infections." *The Journal of International Medical Research*; 2004 Mar-Apr;32(2):132-140.
[21]Fetrow, C. & Avila, J. *Professional's Handbook of Complementary & Alternative Medicines*. Springhouse, PA: Springhouse Corporation, 1999.
[22]"Monograph. Sambucus nigra (elderberry)." *Alternative Medicine Review*; 2005, 10(1):51-54.
[23]Roschek, B. Jr., et. al. "Elderberry flavonoids bind to and prevent H1N1 infection in vitro." *Phytochemistry*; 2009, 70(10):1255-1261.
[24]Orey, C. "Immunity Nutrition." *Energy Times*; 2000, 10(9):25-29.
[25]Aviv, S. "Beta glucan for immunity." *Natural Health*; 2000, 30(9):38.
[26]Shokri, H., et. al. "Isolation of beta-glucan from the cell wall of Saccharomyces cerevisiae." *Natural Product Research*; 2008, 22(5):414-421.
[27]Pelizon, A.C., et. al. "Immunomodulatory activities associated with beta-glucan derived from Saccharomyces cerevisiae." *Physiology Research*; 2005;54(5):557-564.
[28]Tsoni, S.V., Brown, G.D. "beta-Glucans and dectin-1." *Annals of the New York Academy of Sciences*; 2008, 1143:45-60.
[29]Volman, J.J., et. al. "Dietary modulation of immune function by beta-glucans." *Physiology & Behavior*; 2008, 94(2):276-284.
[30]Mantovani MS, et. al. "beta-Glucans in promoting health: prevention against mutation and cancer." *Mutation Research*; 2008, 658(3):154-161.
[31]Akramiene, D., et. al. "Effects of beta-glucans on the immune system." *Medicina*(Kaunas, Lithuania); 2007, 43(8):597-606.
[32]Presser PharmD, A. *Pharmacist's Guide to Medicinal Herbs*. Petaluma, CA: Smart Publications, 2000.
[33]"Echinacea." *Alternative Medicine Review*; 2001, 6(4):411-414.
[34]Zhai, Z., et. al. "Enhancement of innate and adaptive immune functions by multiple Echinacea species." *Journal of Medicinal Food*; 2007, 10(3):423-434.
[35]Cech, N.B., et. al. "Echinacea and its alkylamides: effects on the influenza A-induced secretion of cytokines, chemokines, and PGEv(2) from RAW 264.7 macrophage-like cells." *International Immunopharmacology*; 2010, 10(10):1268-1278.
[36]Linde, K., et. al. "Echinacea for preventing and treating the common cold." *Cochrane Database of Systematic Reviews*; 2006, (1):CD000530.
[37]Shah, S.A., et. al. "Evaluation of echinacea for the prevention and treatment of the common cold: a meta-analysis." *The Lancet Infectious Diseases*; 2007, 7(7):473-480.
[38]Gregory, C. "Study could put echinacea back on cold-and-flu-season shopping list." *Natural Foods Merchandiser*; October, 1999.
[39]Luettig, B., et. al. "Macrophage activation by the polysaccharide arabinogalactan isolated from plant cell cultures of Echinacea purpurea." *Journal of the National Cancer Institute*; 1989, 81(9):669-675.
[40]"Larch: The New Echinacea?" *Nutrition Science News*; September, 1999.
[41]Kim, L.S., et. al. "Immunological activity of larch arabinogalactan and Echinacea: a preliminary, randomized, double-blind, placebo-controlled trial." *Alternative Medicine Review*; 2002, 7(2):138-149.
[42]Kelly, G.S. "Larch arabinogalactan: clinical relevance of a novel immune-enhancing polysaccharide." *Alternative Medicine Review*; 1999, 4(2):96-103.
[43]D'Adamo, P. "Larch Arabinogalactan is a Novel Immune Modulator." *Journal of Naturopathic Medicine*; 1996, (4):32-39.
[44]"Larch arabinogalactan." *Alternative Medicine Review*; 2000 Oct;5(5):463-466.
[45]Kalt, W., et. al. "Antioxidant capacity, vitamin C, phenolics, and anthocyanins after fresh storage of small fruits." *Journal of Agricultural and Food Chemistry*; 1999, 47(11):4638-4644.
[46]Wedge, D.E., et. al. "Anticarcinogenic Activity of Strawberry, Blueberry, and Raspberry Extracts to Breast and Cervical Cancer Cells." *Journal of Medicinal Food*; 2001, 4(1):49-51.
[47]Joseph, J.A., et. al. "Reversals of age-related declines in neuronal signal transduction, cognitive, and motor behavioral deficits with blueberry, spinach, or strawberry dietary supplementation." *Journal of Neuroscience*; 1999, 15;19(18):8114-8121.
[48]Burdulis, D., et. al. "Comparative study of anthocyanin composition, antimicrobial and antioxidant activity in bilberry (Vaccinium

myrtillus L.) and blueberry (Vaccinium corymbosum L.) fruits.“ *Acta Poloniae Pharmaceutica*; 2009, 66(4):399-408.
[49]Wang, Y.P., et. al. "Effect of blueberry on hepatic and immunological functions in mice.“ *Hepatobiliary & Pancreatic Diseases International*; 2010, 9(2):164-168.
[50]Mullen, W., et. al. "Effect of freezing and storage on the phenolics, ellagitannins, flavonoids, and antioxidant capacity of red raspberries.“ *Journal of Agricultural and Food Chemistry*; 2002, 50(18):5197-201.
[51]Wolfe, K.L., et. al. "Cellular antioxidant activity of common fruits.“ *Journal of Agricultural and Food Chemistry*; 2008, 56(18):8418-8426.
[52]Rauha, J.P., et. al. "Antimicrobial effects of Finnish plant extracts containing flavonoids and other phenolic compounds.“ *International Journal of Food Microbiology*; 2000, 56(1):3-12.
[53]Pitchford, P. *Healing with Whole Foods*. Berkeley, CA: North Atlantic Books, 1993
[54]Vinson, J.A., et. al. "Cranberries and cranberry products: powerful in vitro, ex vivo, and in vivo sources of antioxidants.“ *Journal of Agricultural and Food Chemistry*; 2008, 56(14):5884-5891.
[55]Howell, A.B. "Bioactive compounds in cranberries and their role in prevention of urinary tract infections.“ *Molecular Nutrition & Food Research*; 2007, 51(6):732-737.
[56]Ruel, G., Couillard, C. "Evidences of the cardioprotective potential of fruits: the case of cranberries.“ *Molecular Nutrition & Food Research*; 2007, 51(6):692-701.
[57]Côté, J., et. al. "Bioactive compounds in cranberries and their biological properties.“ *Critical Reviews in Food Science and Nutrition*; 2010, 50(7):666-679.
[58]Rossi, A., et. al. "Protective effects of anthocyanins from blackberry in a rat model of acute lung inflammation.“ *Free Radical Research*; 2003, 37(8):891-900.
[59]Hassimotto, N.M., et. al. "Antioxidant status in humans after consumption of blackberry (Rubus fruticosus L.) juices with and without defatted milk.“ *Journal of Agricultural and Food Chemistry*; 2008, 56(24):11727-11733.
[60]Kiefer, D., Pantuso, T. "Panax ginseng.“ *American Family Physician*; 2003, 68(8):1539-1542.
[62]Choi, K.T. "Botanical characteristics, pharmacological effects and medicinal components of Korean Panax ginseng C A Meyer.“ *Acta Pharmacologica Sinica*; 2008, 29(9):1109-1118.
[62]Ahn, J.Y., et. al. "Protection of Staphylococcus aureus-infected septic mice by suppression of early acute inflammation and enhanced antimicrobial activity by ginsan.“ *FEMS Immunology and Medical Microbiology*; 2006, 46(2):187-197.
[63]—. "The immunomodulator ginsan induces resistance to experimental sepsis by inhibiting Toll-like receptor-mediated inflammatory signals.“ *European Journal of Immunology*; 2006, 36(1):37-45.
[64]Helms, S. "Cancer prevention and therapeutics: Panax ginseng.“ *Alternative Medicine Review*; 2004, 9(3):259-274.
[65]Chang, Y.S., et. al. "Panax ginseng: a role in cancer therapy?" *Integrative Cancer Therapies*; 2003, 2(1):13-33.
[66]Song, J.Y., et. al. "Effects of polysaccharide ginsan from Panax ginseng on liver function." *Archives of Pharmacal Research*; 2004, 27(5):531-538.
[67]Smolina, T.P., et. al. [Immunotropic activity of panaxans—bioglycans isolated from ginseng]. *Antibiotiki i Khimioterapiia*; 2001;46(7):19-22.
[68]Kaneko, H., Nakanishi, K. "Proof of the mysterious efficacy of ginseng: basic and clinical trials: clinical effects of medical ginseng, korean red ginseng: specifically, its anti-stress action for prevention of disease.“ *Journal of Pharmacological Sciences*; 2004, 95(2):158-162.
[69]Bouhnik, Y., et. al. "Short-chain fructo-oligosaccharide administration dose-dependently increases fecal bifidobacteria in healthy humans." *The Journal of Nutrition*; 1999, 129(1):113-116.
[70]Tokunaga, T. "Novel physiological function of fructooligosaccharides." *Biofactors*; 2004, 21(1-4):89-94.
[71]Bornet, F.R., et. al. "Nutritional aspects of short-chain fructooligosaccharides: natural occurrence, chemistry, physiology and health implications." *Digestive and Liver Disease*; 2002, 34 Suppl 2:S111-120.
[72]Nakamura, Y., et. al. "Dietary fructooligosaccharides up-regulate immunoglobulin A response and polymeric immunoglobulin receptor expression in intestines of infant mice.“ *Clinical and Experimental Immunology*; 2004, 137(1):52-58.
[73]Shields, J.W. "The functional evolution of GALT: a review.“ *Lymphology*; 2000, 33(2):47-57.
[74]Gillingham, L.G., Lescheid, D.W. "Probiotics and Mucosal Immunity.“ *International Journal of Naturopathic Medicine*; 2009, 4(1):18-22.