VITAQUEST®
DELIVERING WHAT'S NEXT

Guide to Formulating Immune Support Supplements

By By Rick Handel

Staying well and maintaining a healthy immune system can sometimes be challenging. This is especially true during the winter since immune response does not tend to be as effective during the colder months compared to warmer months[1].

Another reason for the challenge is that chronic stress can cause almost all measures of immune system function to drop across the board[2]—and it seems that most people have some degree of chronic stress.

In addition, a poor diet can compromise immune response[3]—and this can be worse during the winter months when the intake of fruit and vegetables drops by about 12%[4] and the intake of overeating patterns are prevalent including the intake of starchy foods and sugary desserts[5].

Another important factor to consider is the significant positive impact of the COVID-19 pandemic on the market. During this time, consumers actively sought immunity boosters, which led to a lasting increase in awareness about the importance of immune support supplements.

For these and other reasons, **immune support supplements** are on the rise. The global immune health supplements market size was about $25.92 billion in 2024, and estimated to grow to $44.04 billion by 2032, exhibiting a CAGR of 6.9% during the forecast period[6].

Understanding the Immune System

A good place to start the discussion of the immune system is by defining it. According to the National Institute of Allergy and Infectious Diseases:

> *The immune system is a network of cells, tissues, and organs that work together to protect the body from infection. The human body provides an ideal environment for many microbes, such as viruses, bacteria, fungi, and parasites, and the immune system prevents and limits their entry and growth to maintain optimal health [7].*

Immunity may be divided into two broad categories: innate and adaptive.

Innate immunity is when inborn mechanisms recognize and respond to the presence of a pathogen. This type of immunity is present at all times in all individuals. It doesn't increase with repeated exposure to a given pathogen[8].

Adaptive immunity, on the other hand, is a learned response of specific lymphocytes to a specific antigen, meaning a molecule or substance that the immune system recognizes as a threat. This response can lead to the development of immunological memory (e.g. antibodies). Adaptive immune responses are distinct from innate immunity, which isn't mediated by the selection of antigen-specific lymphocytes. Adaptive immune responses are also known as acquired immune responses[9].

The Role of Supplements for Immune Support

Ideally, in promoting a strong, healthy immune system, the goal should be to support both innate and adaptive immunity. Your immune system needs certain vitamins and minerals to work properly.

According to the National Institutes of Health's Office of Dietary Supplements, supplements to support immune health include vitamin C, vitamin D, and zinc. Herbal supplements, probiotics, and other dietary supplement ingredients might also have a positive effect on your immune system[10]. These may also include selenium, beta 1,3/1,6 glucan, elderberry and Echinacea.

Key Immune Support Supplements

Some key immune-boosting supplements that can be used in formulations include:

- **H3: Vitamin C** affects various components of the human immune response, including antimicrobial and natural killer cell activities, and lymphocyte (white blood cell) proliferation[11]. Supplementation with 500 mg daily has been shown to promote immune/respiratory health[12] and increase the lymphocyte activity of superoxide dismutase (SOD) and catalase, both powerful and protective antioxidants[13].
- **H3: Vitamin D** promotes the function of multiple immune cells, including B cells, T cells, and antigen-presenting cells[14].

- **H3: Zinc** is integral to the immune system[15], affecting multiple immune activities from lymphocyte gene regulation to the skin barrier[16], and decreasing oxidative stress markers[17]. Zinc is crucial for normal development and function of cells mediating nonspecific immunity such as neutrophils and natural killer cells[18].
- **Selenium** helps form the *antioxidant enzyme glutathione peroxidase*, which influences the immune system[19] and provides protection against free radicals and other damaging reactive oxygen species [20]. Supplementation with selenium has also been shown to provide effective support for a healthy immune response[21].
- **Beta 1,3/1,6 glucan** is a yeast beta glucan that helps prime and strengthen the function of predominant immune cells known as *neutrophils*. Multiple studies demonstrate that supplementation promotes immune respiratory health[22 23 24].
- **H3: Elderberry** supports antibody production, is a clinically tested immune booster, and significantly improved immune measures in 48 hours[25 26 27].
- **H3: Probiotics** appear to help create a microbial barrier within the intestine. Specifically, they produce antimicrobial substances that are effective against many harmful foreign invaders[28 29].
- **H3: Echinacea** is the granddaddy of all immune-enhancing herbs. It supports the immune system through the activation of white blood cells (*lymphocytes and macrophages*),30 and by increasing the number of T cells[31 32].
- **H3: N-Acetyl Cysteine (NAC)** helps replenish glutathione and reduce damage caused by free radicals/reactive oxygen species (ROS)[33]. Human clinical research also shows that supplementing with NAC was effective in promoting cell-mediated immunity when used for six months[34].

It is essential to use the appropriate form of nutraceutical ingredients to achieve optimal results. For instance, research strongly supports the efficacy of Echinacea extract over Echinacea powder for immune health. A qualified contract development and manufacturing organization (CDMO) can offer valuable guidance on selecting the right forms of ingredients to ensure the best possible outcomes.

Should You Include Branded or Generic Ingredients in Your Immune Support Supplement?

Perhaps you've decided on the active ingredients you want to include in your immune support supplement—but that's only the first step of the nutraceutical decision-making process.

The second step is to decide on the source. Specifically, do you want to use branded ingredients or generic ingredients? Advantages of using branded ingredients include greater consumer awareness, a greater likelihood that clinical research has been conducted on those ingredients to support claims, and trademarks (and possibly patents) which will help you differentiate your formulation from generic competitors. Also, consider that consumers are likely to view trademarks and patents on branded ingredients as being reflective of a high level of quality and standards.

Unbranded or generic ingredients are those that aren't branded, trademarked, or patented. These may be commodity ingredients, such as vitamin C (ascorbic acid). The major advantage of unbranded or generic ingredients is that they are less expensive and can typically be sourced from multiple suppliers. However, they may not have research on them to support claims.

An experienced CDMO can help you choose reputable ingredient suppliers—whether you prefer branded or generic ingredients.

The Pros & Cons
of Generic and Branded Ingredients

Use this guide to make the best decision for your business and customers

Pros
of Branded Ingredients

- Raised consumer awareness.
- Enhanced product appeal and perceived quality.
- Patents/trademarks reflect commitment to quality & innovation.
- Patent research adds credibility to ingredient claims.
- Scientific studies validate efficacy & safety.
- Strong documentation for quality & purity.
- Functional advantages over generic ingredients.

Cons
of Branded Ingredients

- Typically more expensive.
- Finding the right ingredient partner can be challenging.
- Must purchase specifically for your order.
- Minimum order quantities may exceed needs.
- Supply chain issues.

Pros
of Generic Ingredients

- Lower cost.
- Reduced supply chain risk with multiple suppliers.
- Branding unnecessary for common materials.
- Easier to include in formulations while keeping costs low.

Cons
of Generic Ingredients

- Claims not supported by research.
- Potentially lower bioavailability.
- May not meet exact specifications in studies.
- Higher risk of poor quality.

Are you ready to move forward with the development of supplements with the right ingredients for your brand?
Call 800-526-9095 or **Visit Vitaquest.com** for more information!

VITAQUEST®

Common Immune Formulation Mistakes

When developing immune support supplements, two common formulation pitfalls can compromise product efficacy and credibility: “fairy dusting” and selecting the wrong probiotic.

Fairy Dusting

To make immune support products appear comprehensive, brand owners sometimes include a wide array of nutraceuticals in their formulations. However, a frequent misstep is “fairy dusting”—adding trace amounts of numerous ingredients that are too small to be effective or scientifically substantiated.

This approach has several drawbacks. First, it fails to deliver meaningful benefits to the end user. Second, it prevents the brand owner from substantiating health claims, which can impact regulatory compliance and marketing. Lastly, informed consumers who recognize fairy dusting may view such products as untrustworthy, ultimately harming the brand’s reputation. To create a robust and reputable product, it’s crucial to focus on delivering efficacious doses backed by solid research.

Using the Wrong Probiotic

Probiotics offer tremendous potential for supporting immune health but incorporating them into a multi-ingredient immune formula can be tricky. Not all probiotic strains are compatible with other ingredients. The primary concern is moisture: probiotics are typically in a freeze-dried state and are activated upon exposure to moisture. This activation is meant to occur in the body, not within the product. If reactivation happens prematurely—inside a capsule or powder—the probiotics may die off due to lack of sustenance.

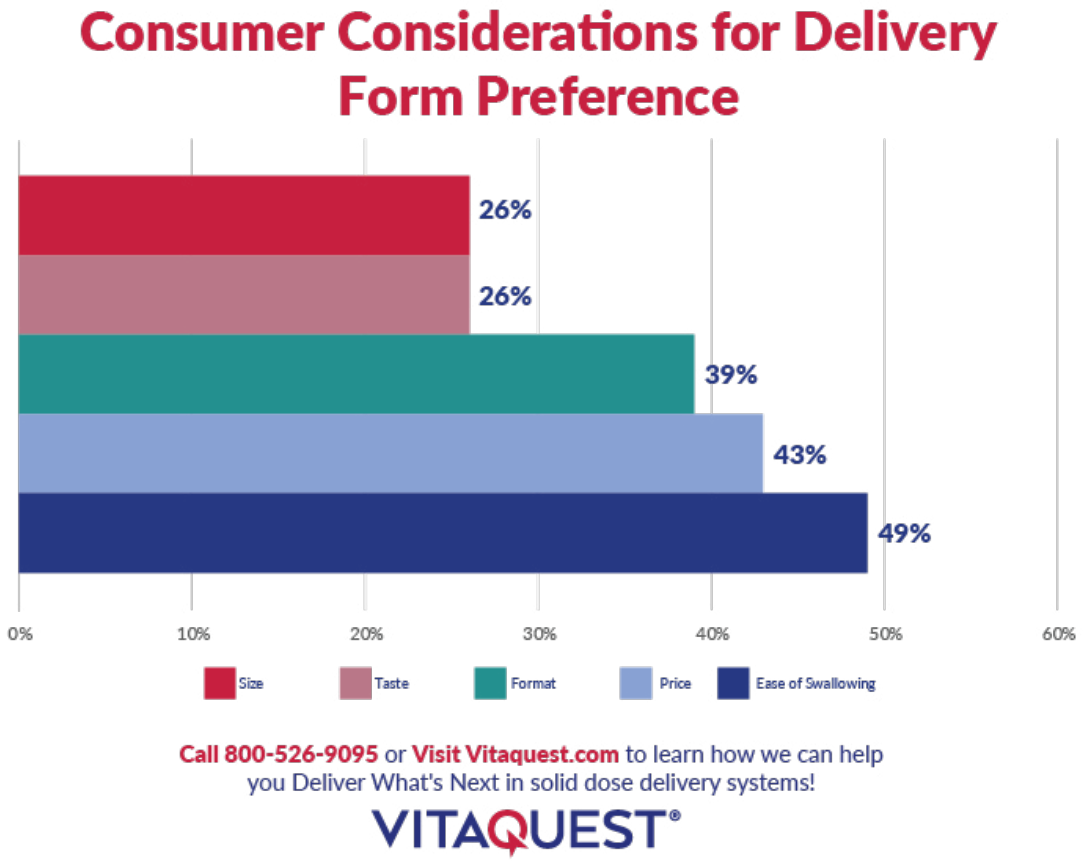
To address this, it’s essential to select probiotic strains that are less sensitive to residual moisture from other ingredients. Partnering with an experienced CDMO can help ensure the selection of stable probiotic strains that integrate effectively with other nutraceuticals in your formula, maximizing the product’s effectiveness and shelf life. A CDMO experienced in working with probiotics will also take measures to ensure that the manufacturing and packaging environments are climate-controlled to maintain strict humidity limits.

Preferred Delivery Forms

While capsules are the most common delivery format for immune health supplements, exploring alternative formats can offer unique advantages and cater to consumer preferences. Two noteworthy options include effervescent tablets and orally disintegrating tablets (ODTs):

- Effervescent tablets – Designed to dissolve and fizz in water, effervescent tablets offer a controlled-release mechanism that can enhance the absorption of active ingredients compared to traditional solid oral dosage forms. This delivery method is particularly appealing to consumers familiar with over-the-counter (OTC) effervescent products, as they associate this format with fast-acting benefits.
- Orally disintegrating tablets (ODTs) – ODTs, sometimes called fast-melts or quick-dissolve tablets, are formulated to dissolve in the mouth before swallowing. This format provides several advantages, including rapid dissolution and absorption, ease of consumption without water, and improved user compliance. These qualities make ODTs an excellent option for consumers seeking convenience and quick results.

These alternative delivery forms are gaining traction among consumers, particularly those experiencing "pill fatigue." According to *Natural Products Insider*[35], several factors are driving the growth of these innovative formats. Millennials, in particular, are at the forefront of this trend, with nearly half (49%) preferring alternatives to traditional pills and capsules—significantly more than older generations.



As the largest generational group in the U.S. in 2022, with an estimated population of 72.24 million[36], Millennials wield considerable influence over market trends. Their strong preference for alternative formats makes them more likely to purchase effervescent tablets or ODTs. For supplement brands, catering to this demographic represents a strategic opportunity to meet evolving consumer demands and drive market growth.

Conclusion

Vitaquest is a CDMO that has provided supplement brands with exceptional supplement research and development, manufacturing, packaging design, powder and particle engineering services using fluid bed, oscillation, and roller compaction technologies, and fulfillment solutions for over 45 years. Whether you're a newcomer to the industry or aiming to diversify your product range, Vitaquest possesses the expertise, cutting-edge facilities, and solutions needed to swiftly and effectively turn your immune support supplement concept into reality.

Vitaquest offers a variety of dosage forms, including capsules, tablets, chewable tablets, oral disintegrating tablets, effervescents and powders. Furthermore, you'll receive an exceptional level of customer support.

Vitaquest also has expertise in domestic and international regulatory standards, as well as sustainability practices. Sourcing sustainable ingredients and using eco-friendly manufacturing processes can enhance brand appeal. Our FDA cGMP compliance – as well as third-party GMP certification from NSF, USP, and others – assures both brand owners and consumers that we meet industry regulations and standards. Likewise, our ability to offer Kosher, Halal, and certified organic products, and FSSC 22000 certification for food safety are relevant certifications for manufacturing excellence.

Are you ready to capitalize on the immune support supplement trends? If so, call 800-526-9095 o speak with one of our knowledgeable sales executives or request a nutraceutical manufacturing price quote if you've already finalized your project requirements!

Frequently Asked Questions About Formulating Immune Support Supplements

Q: How can I boost my immune system quickly?

Promoting a strong immune system doesn't happen overnight. It requires a variety of important nutrients including vitamin C, vitamin D, zinc and selenium. That being said, there are some nutraceuticals with research showing a relatively fast onset of action. These include the herbs Echinacea and Elderberry.

Q: Do immunity supplements work?

Well-formulated immune supplements can do a great deal to help support a healthy immune response. The National Institutes of Health, Office of Dietary Supplements, indicates that vitamin C, vitamin D, and zinc may be helpful. Other dietary supplement ingredients that provide immune support include probiotics, selenium, beta 1,3/1,6 glucan, elderberry and Echinacea.

About Rick Handel, Senior Vice President of Commercial Operations

Rick Handel is a 50-year veteran of the nutraceutical industry, with a strong background in formulation, R&D and GMP manufacturing of dietary supplements. Rick is celebrating 30 years with industry-leading supplement manufacturer Vitaquest International, where he currently serves as Senior Vice President of Commercial Operations. In that capacity, Rick is responsible for driving sales and innovation by identifying and developing new strategies, business opportunities, science-backed ingredients, and novel delivery technologies. Rick holds eight patents and has presented his published scientific papers and studies at conferences around the world.

References

1 Khoo AL, Chai LY, Koenen HJ, Kullberg BJ, Joosten I, van der Ven AJ, Netea MG. 1,25-dihydroxyvitamin D3 modulates cytokine production induced by Candida albicans: impact of seasonal variation of immune responses. J Infect Dis. 2011;203(1):122-30.

2 Segerstrom SC, Miller GE. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. Psychol Bull 2004;130(4):601-30.

3 Segerstrom SC, Miller GE. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. Psychol Bull 2004;130(4):601-30.

4 Amanatidis S, Mackerras D, Simpson JM. Comparison of two frequency questionnaires for quantifying fruit and vegetable intake. Public Health Nutrition. 2001; 4(2), 233-239.

5 Klesges RC, Klem ML, Bene CR. Effects of dietary restraint, obesity, and gender on holiday eating behavior and weight gain. J Abnorm Psychol. 1989;98(4):499-503.

6 Immune Health Supplements Market Size, Share & Industry Analysis, By Ingredient Type (Vitamins, Minerals, Herbal Botanical Extracts, Probiotics, Amino Acids, Omega-3 Fatty Acids, Others), By Form (Soft Gels/Capsules, Tablets, Powder, Liquids, and Others), By Source Type (Plant Based, Animal Based), By Distribution Channel (Pharmacies and Drug Stores, Hypermarket/Supermarket, Online Stores, Specialty Store, Others) and Regional Forecast, 2024-2032. Retrieved November 6, 2024 from https://www.fortunebusinessinsights.com/immune-health-supplements-market-103319.

7 U.S. Department of Health and Human Services, National Institutes of Health. Immune System. Last Updated January 23, 2014. Retrieved February 3, 2014 from http://www.niaid.nih.gov/topics/immunesystem/Pages/default.aspx.

8 Chapter: Principles of innate and adaptive immunity. Janeway CA Jr, Travers P, Walport M, et al. Immunobiology: The Immune System in Health and Disease. 5th edition. New York: Garland Science; 2001.

9 Chapter: Principles of innate and adaptive immunity. Janeway CA Jr, Travers P, Walport M, et al. Immunobiology: The Immune System in Health and Disease. 5th edition. New York: Garland Science; 2001.

10 Dietary Supplements for Immune Function and Infectious Diseases. National Institutes of Health, Office of Dietary Supplements. Updated November 14, 2023. Retrieved November 6, 2024 from https://ods.od.nih.gov/factsheets/ImmuneFunction-Consumer/.

11 Khassaf M, McArdle A, Esanu C, Vasilaki A, McArdle F, Griffiths RD, Brodie DA, Jackson MJ. Effect of vitamin C supplements on antioxidant defense and stress proteins in human lymphocytes and skeletal muscle. J Physiol. 2003 Jun 1;549(Pt 2):645-52.

12 Sasazuki S, Sasaki S, Tsubono Y, Okubo S, Hayashi M, Tsugane S. Effect of vitamin C on common cold: randomized controlled trial. Eur J Clin Nutr. 2006 Jan;60(1):9-17.

13 Khassaf M, McArdle A, Esanu C, Vasilaki A, McArdle F, Griffiths RD, Brodie DA, Jackson MJ. Effect of vitamin C supplements on antioxidant defense and stress proteins in human lymphocytes and skeletal muscle. J Physiol. 2003 Jun 1;549(Pt 2):645-52.

14 Aranow C. Vitamin D and the Immune System. J Investig Med. 2011 Aug; 59(6): 881–886.

15 Food and Nutrition Board, Institute of Medicine. Zinc. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, D.C.: National Academy Press; 2001:442-501.

16 Food and Nutrition Board, Institute of Medicine. Zinc. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, D.C.: National Academy Press; 2001:442-501.

17 Prasad AS. Zinc in human health: effect of zinc on immune cells. Mol Med 2008; 14(5-6): 353-7.

18 Shankar AH, Prasad AS. Zinc and immune function: the biological basis of altered resistance to infection. Am J Clin Nutr. 1998 Aug;68(2 Suppl):447S-463S.

19 Arthur JR, McKenzie RC, Beckett GJ. Selenium in the immune system. J Nutr 2003; 133(5 Suppl 1): 1457S-9S.

20 Food and Nutrition Board, Institute of Medicine. Selenium. Dietary reference intakes for vitamin C, vitamin E, selenium, and carotenoids. Washington D.C.: National Academy Press; 2000:284-324.

21 Goldson AJ, Fairweather-Tait SJ, Armah CN, et al. Effects of selenium supplementation on selenoprotein gene expression and response to influenza vaccine challenge: a randomized controlled trial. PLoS One. 2011 Mar 21;6(3):e14771.

22 Fuller R, Butt H, Noakes PS, Kenyon J, Yam TS, Calder PC. Influence of yeast-derived 1,3/1,6 glucopolysaccharide on circulating cytokines and chemokines with respect to upper respiratory tract infections. Nutrition. 2012 Jun;28(6):665-9.

23 Talbott SM, Talbott JA. Baker's yeast beta-glucan supplement reduces upper respiratory symptoms and improves mood state in stressed women. J Am Coll Nutr. 2012 Aug;31(4):295-300.

24 Talbott S, Talbott J. Beta 1,3/1,6 Glucan Decreases Upper Respiratory Tract Infection Symptoms and Improves Psychological Well-Being in Moderate to Highly-Stressed Subjects. Agro Food Industry Hi-Tech. 2010;21:21-24.

25 Zakay-Rones Z1, Varsano N, Zlotnik M, Manor O, Regev L, Schlesinger M, Mumcuoglu M. Inhibition of several strains of influenza virus in vitro and reduction of symptoms by an elderberry extract (Sambucus nigra L.) during an outbreak of influenza B Panama. J Altern Complement Med. 1995 Winter;1(4):361-9.

26 Kong F. Pilot Clinical Study on a Proprietary Elderberry Extract: Efficacy in Addressing Influenza Symptoms, Online J Pharmacol Pharmacokin 5:32-43, 2009.

27 Kong F-K. Pilot Clinical Study on a Proprietary Elderberry Extract: Efficacy in Addressing Influenza Symptoms, Online J Pharmacol Pharmacokin. 2009; 5:32-43.
28 Lievin V, Peiffer I, Hudault S, et al. Bifidobacterium strains from resident infant human gastrointestinal microflora exert antimicrobial activity. Gut 2000;47:646-52.
29 Rastall RA. Bacteria in the gut: friends and foes and how to alter the balance. J Nutr 2004;134:2022S-2026S.
30 See DM, Broumand N, Sahl L, Tilles JG. In vitro effects of echinacea and ginseng on natural killer and antibody-dependent cell cytotoxicity in healthy subjects and chronic fatigue syndrome or acquired immunodeficiency syndrome patients. Immunpharmacol 1997;35:229–35.
31 Zwickey H, Brush J, Iacullo CM, Connelly E, Gregory WL, Soumyanath A, Buresh R. The effect of Echinacea purpurea, Astragalus membranaceus and Glycyrrhiza glabra on CD25 expression in humans: a pilot study. Phytother Res. 2007 Nov;21(11):1109-12.
32 Brush J, Mendenhall E, Guggenheim A, Chan T, Connelly E, Soumyanath A, Buresh R, Barrett R, Zwickey H. The effect of Echinacea purpurea, Astragalus membranaceus and Glycyrrhiza glabra on CD69 expression and immune cell activation in humans. Phytother Res. 2006 Aug;20(8):687-95.
33 Kelly GS. Clinical applications of N-acetylcysteine. Altern Med Rev 1998;3:114-27.
34 De Flora S, Grassi C, Carati L. Attenuation of influenza-like symptomatology and improvement of cell-mediated immunity with long-term N-acetylcysteine treatment. Eur Respir J 1997;10:1535-41.
35 Molyneaux M. Millennials drive growth in non-pill supplement forms. Natural Products Insider. May 9, 2019. Retrieved January 27, 2024 from https://www.naturalproductsinsider.com/supplements/millennials-drive-growth-in-non-pill-supplement-forms
36 Korhonen V. Resident population in the United States in 2022, by generation. Statista. August 29, 2023. Retrieved January 27, 2024 from https://www.statista.com/statistics/797321/us-population-by-generation/#:~:text=Millennials%20were%20the%20largest%20generation,the%20population%20for%20many%20years.

© 2025 VITAQUEST INTERNATIONAL LLC. ALL RIGHTS RESERVED