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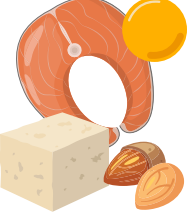


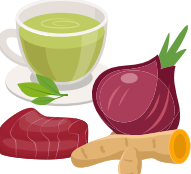
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Food First—Supporting Immune Health with Nutrition

A healthy immune system is an essential aspect of optimal health and wellness. By providing essential vitamins, minerals, and phytonutrients, plant-based foods play an important role in maintaining and positively influencing immune function.¹ Phytonutrients, also known as phytochemicals, are components of plants that help protect them from insects and environmental stress and contribute to health benefits.² This can include things like carotenoids (red- and orange-colored foods), flavonoids (plant-based foods that act as an antioxidant), and phytosterols (natural plant compounds that help remove cholesterol from body). Through antimicrobial, antioxidant, and anti-inflammatory actions, these essential nutrients and phytonutrients provide multiple benefits to the immune system, highlighting the role of nutrition as a powerful tool in promoting good health.¹ Focusing on a rich variety of colorful plant foods, along with adopting healthy lifestyle behaviors, can help you and your family stay healthy.

Nutrients	Foods Sources ^{3,14}		Benefits
Vitamin A ⁴⁻⁶ (converted from beta-carotene and other carotenoids)	Orange- and yellow-colored fruits and vegetables including peppers, carrots, pumpkins, tomatoes, & potatoes		Important for lung health; supports immune response against infections (skin, mouth, gastrointestinal, and respiratory systems)
Vitamins C ^{7,8}	Colorful berries, cantaloupe, peppers, citrus fruits, broccoli, Brussels sprouts, cauliflower, sweet potatoes, tomatoes, nuts, and sunflower seeds		Increases action of lymphocytes (white blood cells) within the immune system that help fight off viruses; plays a role in prevention and treatment of infections
Vitamin D ⁹⁻¹²	Egg yolks, fatty fish (salmon, mackerel, and sardines), cod liver oil, vitamin D-fortified foods (milk, cheese, orange juice, and cereals) Vegetarian options: beans, nuts, tofu, and wheat germ		Protects against upper respiratory infections and flu and can reduce related complications
Selenium ¹³	Highest in Brazil nut, sea fish (tuna, mackerel); soil quality determines level of selenium in plant-based foods		Strengthens immune response against viral and bacterial infections; plays a role as an antioxidant to lower inflammation
Zinc ^{15,16}	Legumes (peas, beans, lentils, soy beans), oysters, red meat, poultry, nuts, whole grains, & dairy products		Improves resistance to infections; promotes wound healing; supports barriers (skin and gut lining)
Other supportive food-based nutrients ¹⁷⁻¹⁹	Green tea (EGCG), onions and garlic (quercetin), turmeric (curcumin), fish (omega-3 fatty acids)		Support immune system through antifungal, antioxidant, and antibacterial actions

Prebiotics: Specialized plant fibers that are a food source for probiotics and support immune system by increasing population of beneficial bacteria.

Prebiotic foods: leeks, garlic, onions, asparagus, bananas, dandelion greens, Jerusalem artichoke, burdock root



Probiotics: Live bacteria and yeasts that are good for you, especially your digestive system; often called beneficial bacteria because they help keep your gut healthy. They can support immune response-related diseases, such as allergy, eczema, and viral infection.

Probiotic foods: kefir, miso soup, kombucha, yogurt, apple cider vinegar, pickles, raw cheese, kimchi, sauerkraut



Tips for supporting immune response with nutrition:

- **Aim for color and diversity.** Consume 2 or more vegetables per meal and aim for 3 or more colors per day to ensure you consume a wide variety of immune-supportive nutrients.
- **To retain nutrients:** Eat fresh fruits and vegetables when possible. Do not overcook. Steaming for less than 2 minutes is ideal to preserve nutrients.
- **Several nutrients (including vitamins A, D, and E)** are fat-soluble and are more bioavailable (better absorbed) if eaten with a source of quality fats. For example, consuming a salad with higher fat vs. lower fat dressing can help promote absorption of carotenoids (vitamin A).²²

Food First Recipes

Berry Nutty Yogurt Servings: 1

Ingredients:

4 oz. plain Greek yogurt
1 cup mixed berries (strawberries, blueberries, and raspberries)
2 Tbsp. sliced almonds (or nut of choice)

Directions:

Mix berries, nuts with yogurt. Enjoy!

Peach Salsa Servings: 8 (½ cup)

Ingredients:

4 peaches OR nectarines diced
½ cup minced red onion
2 Tbsp. chopped fresh mint
2 Tbsp. chopped cilantro OR parsley
1 Tbsp. seeded and minced jalapeno chili (optional)

Directions:

Combine all ingredients except salt and pepper in a large bowl. Cover and chill for 30-60 minutes. Allow to warm to room temperature before serving and stir in salt/pepper to taste. Enjoy!

Tip: Great topping for seafood

1 Tbsp. grated orange zest
2 Tbsp. fresh orange juice
2 Tbsp. fresh lime juice
Sea salt and freshly ground pepper to taste

References:

1. Prakash D. Phytonutrients as therapeutic agents. *J Complement Integr Med.* 2014;11(3):151-169.
2. Hager TJ et al. Processing effects on carrot phytonutrients. *Hortscience.* 2006;41(1):74-75.
3. <https://www.eatright.org/health/wellness/preventing-illness/how-to-keep-your-immune-system-healthy>. Accessed March 24, 2020.
4. Xavier AA et al. Carotenoids as a source of antioxidants in the diet. *Subcell Biochem.* 2016;79:359-375.
5. Dowling JE. Vitamin A: its many roles - from vision and synaptic plasticity to infant mortality. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol.* 2020. [Epub ahead of print].
6. Timoneda J et al. Vitamin A deficiency and the lung. *Nutrients.* 2018;10(9):1132.
7. Mousavi S et al. Immunomodulatory and antimicrobial effects of vitamin C. *Eur J Microbiol Immunol (Bp).* 2019;9(3):73-79.
8. Carr AC et al. Vitamin C and immune function. *Nutrients.* 2017;9(11):pii: E1211.
9. Lemire JM et al. 1,25-dihydroxyvitamin D3 suppresses human T helper/inducer lymphocyte activity in vitro. *J Immunol.* 1985;134:3032-3035.
10. Cantorna MT et al. Vitamin D and 1,25(OH)2D regulation of T cells. *Nutrients.* 2015;7:3011-3021.
11. Gruber-Bzura BM. Vitamin D and influenza - prevention or therapy? *Int J Mol Sci.* 2018;19(8):2419.
12. Mandlik R et al. Occurrence of infections in schoolchildren subsequent to supplementation with vitamin D-calcium or zinc: a randomized, double-blind, placebo-controlled trial. *Nutr Res Pract.* 2020;14(2):117-126.
13. Huang Z et al. The role of selenium in inflammation and immunity: from molecular mechanisms to therapeutic opportunities. *Antioxid Redox Signal.* 2012;16(7):705-743.
14. Steinbrenner H et al. Dietary selenium in adjuvant therapy of viral and bacterial infections. *Adv Nutr.* 2015; 6(1):73-82.
15. Roxas M et al. Colds and influenza: A review of diagnosis and conventional, botanical, and nutritional considerations. *Alt Med Rev.* 2007;12(1):25-48.
16. Dardenne M. Zinc and immune function. *Eur J Clin Nutr.* 2002;56(3):520-523.
17. Nieto et al. Antioxidant and antimicrobial properties of rosemary (*Rosmarinus officinalis*, L.): A Review. *Medicines (Basel).* 2018;5(98):1-13.
18. Santangelo R et al. Ginsenosides, catechins, quercetin and gut microbiota: Current evidence of challenging interactions. *Food Chem Toxicology.* 2019;123:42-49.
19. Xu XY et al. Bioactivity, health benefits, and related molecular mechanisms of curcumin: current progress, challenges, and perspectives. *Nutrients.* 2018;10(1553):1-33.
20. Shokryazdan P et al. Effects of probiotics on immune system and cytokine expression. *Med Microbiol Immunol.* 2017;206:109.
21. University of Florida. <https://edis.ifas.ufl.edu/fs17>. Accessed March 24, 2020.
22. Brown et al. Carotenoid bioavailability is higher from salads ingested with full-fat than with fat-reduced salad dressings as measured with electrochemical detection. *Am J Clin Nutr.* 2004;80:396-403.

