

NUTRITION FOR HEALTHY IMMUNE FUNCTION

A variety of essential nutrients play key roles to support proper immune function. These nutrients work together at every stage of the immune response to maintain or enhance immune cell activity. Specifically, the group of nutrients includes: vitamin A, vitamin C, vitamin D, vitamin E, B6, B12, folate, copper, iron, magnesium, selenium and zinc.

- These nutrients work together to maintain the health of skin, body hair and mucus membranes in the lungs and digestive tract to prevent entry of infectious organisms into the body – this provides a physical barrier to infection.
- Protects cell membranes from damage caused by infection
- Supports healthy function of the digestive tract which limits entry of disease-causing organisms into the body through the intestines
- Enhances and optimizes immune cell activity to better fight infections
- Regulates antimicrobial effects to help kill pathogens
- Increases the body's anti-inflammatory response to fight infection
- Important for antibody production and function

Factors that reduce immune function and increase the body's need for these nutrients:

- Stress
- Lack of Sleep
- Reduced physical activity
- Unbalanced diet limiting adequate intake of nutrients to support the immune system
- Environmental factors such as air pollution

Source: Gombart, A.F.; Pierre, A.; Maggini, S. A Review of Micronutrients and the Immune System – Working in Harmony to Reduce the Risk of Infection. *Nutrients* 2020, 12, 236.



Food sources of Vitamin A: Sweet potatoes, pumpkin (canned pumpkin), Winter squash (acorn, butternut, spaghetti), carrots, red and orange bell peppers, apricots (fresh or dried), mango, papaya, cantaloupe, avocado, broccoli, spinach, kale, dark leafy greens, eggs, fish (canned tuna), fortified milk

Food sources of Vitamin C: Oranges, lemons, limes, pineapple, strawberries, raspberries, blueberries, cranberries, watermelon, kiwi, tomatoes, green bell peppers, broccoli, kale, potatoes

Food sources of Vitamin D: Fortified milk, ricotta cheese, eggs, salmon (fresh or canned), tuna (fresh or canned), sardines, shrimp, oysters, tofu, mushrooms

Food sources of Vitamin E: Almonds, almond butter, sunflower seeds, peanuts, peanut butter, avocado, olives, olive oil, any vegetable oil, salmon, shrimp, broccoli, spinach, kale

Food sources of B6: Lean beef, lean pork, chicken, turkey, fish (salmon, tuna), pistachios, sunflower seeds, banana, dried apricot, spinach

Food sources of B12: Lean beef, lean pork, chicken, turkey, fish (salmon, tuna, sardines, trout) shellfish (crab, clams, mussels), milk, non-fat plain Greek yogurt, Swiss cheese, eggs

Food sources of Folate: Spinach, kale, leafy greens, broccoli, asparagus, cauliflower, Brussels sprouts, beets, bell peppers, avocado, oranges, papaya, nuts and seeds, beans (pinto, black or red beans), peas, lentils

Food sources of Copper: Shellfish (shrimp, oysters), fish (salmon), tofu, cashews, sesame seeds, shiitake mushrooms, sweet potatoes, garbanzo beans, avocados, dark chocolate (at least 70% cocoa)

Food sources of iron: Lean beef, lean pork, chicken, turkey, fish, shellfish, spinach, kale, leafy greens, dried apricots, prunes, beans, lentils

Food sources of Magnesium: Spinach, almonds, almond butter, pumpkin seeds, peanuts, peanut butter, cashews, quinoa, oats, oatmeal, beans, avocado, dark chocolate (at least 70% cocoa), unsweetened cocoa powder

Food sources of Selenium: Lean beef, lean pork, chicken, turkey, fish (tuna, halibut, sardines), shellfish (shrimp, oysters), eggs, Brazil nuts, chia seeds, spinach

Food sources of Zinc: Lean beef, chicken, fish, shellfish, almonds, cashews, pumpkin seeds, spinach, mushrooms, dark chocolate (at least 70% cocoa), unsweetened cocoa powder

