Immune System 101: How does it work?
Most people imagine the immune system to be like those cold and flu commercials they see on TV: your germ-fighting warriors attack the nasty viruses once they’ve spread throughout your body. In fact, our immune system is much more complex and not only helps heal us, but also prevents us from getting sick as well. Your immune system is our protective network designed to fend off invasion from harmful substances, including bacteria, viruses, fungi and dangerous chemicals.

Stress and Immune Suppression
Your immune system also works to support your cells and organs and repair the damage caused by stress. Research has found that during intense physical exertion, your body produces certain hormones that temporarily lower immunity. Cortisol and adrenaline – known as the stress hormones – raise blood pressure and cholesterol levels, and they can suppress your immune system.

Due to the strain placed on your immune system, your body is most susceptible to contracting infections and getting sick or injured immediately during and after times of physical, mental and emotional stress. This is called immune suppression – stress lessens the ability of your white blood cells to do their job protecting your body. Prolonged bouts of repeated and strenuous exercise suppress immune function and give viruses a window of opportunity to gain a foothold and start an infection. Psychological stress, lack of sleep, and malnutrition that can also go along with exercise and athletic competitions only further depress immunity, putting you at increased risk of infection.

Beyond these factors making you more likely to get sick when training harder and more frequently – the very activities you’re doing can increase your chances of getting sick, too! During exercise, exposure to airborne bacteria and viruses goes up because of a higher rate and depth of breathing. To top it off, if you’re traveling to competitions, you’re exposed to large crowds, air travel and public facilities that host and rapidly spread germs. And if that’s not enough, if you’re an athlete in a contact sport, skin abrasions and skin-to-skin contact increases your risk of skin infections.

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Immune Function and Endurance Sport (continued)

**Nutrients and Immunity**
While none of us want to (or should) give up our love of sports and exercise just to avoid getting sick, there has to be a way to protect your body while continuing to get stronger, faster and healthier.

An essential component in maintaining your natural defenses and fighting off infections is adequate nutrition—in particular, the appropriate intake and timing of nutrients (i.e., carbohydrates, fats, proteins, vitamins and minerals) can make all the difference. Immune cells are highly energy demanding and cannot function without proper nutrition.

**Glucose and Glutamine**
The key fuels used by your immune system are glucose and glutamine. Glucose gives your body the immediate energy it needs to keep your immune system working. Training with optimal stores of glycogen (the form of glucose stored in your muscles and liver) not only provides fuel for your workouts but also boosts your immune system. Preliminary research suggests that consuming carbohydrates before exercise seems to diminish some of the immunosuppressive effects of intense training.

Glutamine is the most abundant amino acid in your body, and serves as a metabolic fuel for nearly all your cells and organs—including those that make up your immune system. The problem is cortisol (the stress hormone), which lowers glutamine levels in your body, creating the perfect environment for illness and injury to set in. Blood levels of glutamine drop during endurance exercise and remain lowered during the recovery phase for several hours afterwards. To keep your immune system running strongly, you must replenish both glycogen and glutamine stores with adequate recovery time between sessions.

**Putting it into Practice: How to Train Hard and Stay Healthy**
If you want to train hard and stay healthy, post-workout recovery nutrition is essential. Specific foods strengthen your immune system and help prevent (continued on the next page...
unwanted interruptions in your training program. Fruits and vegetables contain hundreds of phytonutrients that provide many health benefits. They are also excellent sources of carotenoids which boost the activity of white blood cells (your body’s soldiers that fight off attacks and inflammation).

Other nutrients important for a strong immune system are:

- Zinc
- Iron
- Vitamin C
- Vitamin D
- Vitamin B₁₂
- Vitamin B₁₆

Unfortunately, many endurance athletes are already deficient in these nutrients to begin with and have an even greater need for maintenance through whole food nutrition.

On your next trip to the grocery store, be sure to stock up on these high net-gain foods to help boost immune function:

- Berries
- Brazil nuts
- Broccoli
- Citrus fruits
- Dark green leafy vegetables
- Garlic
- Ginger
- Green tea
- Hot peppers
- Probiotics
- Pumpkin seeds
- Shitake and other mushrooms
- Turmeric

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Several amazingly beneficial supplements include:

- Astragalus
- Chlorella
- Ginseng
- L-Glutamine
- Iron
- Rhodiola
- Vitamin A
- Vitamin C
- Vitamin D
- Vitamin E
- Zinc

Exercise puts added physical and hormonal stress on your body, lowering your immune function. Falling short of your caloric requirements and having a poorly planned diet will further compromise your immune system. Without a strong immune system your body won’t be able to restore and rejuvenate itself after exercise. To stop this vicious cycle in its track and make sure that you don’t leave yourself susceptible to infection and injury, be sure to eat nutrient dense meals full of immune boosting foods.

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For more *Thriving* check out Brendan's Thrive Trilogy of books.

Thrive Foods, Thrive: The Vegan Nutrition Guide, and Thrive Fitness
(In Canada: Whole Foods to Thrive, Thrive Diet, and Thrive Fitness)

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