



GET ACTIVE: BETTER PERFORMANCE THROUGH BETTER NUTRITION

The importance of nutrition to physical performance has been understood for centuries. Early hunters knew that to sustain the energy output required for them to hunt they needed to eat frequently to replenish expended energy. The same is true for the heavy labor associated with farming, construction, and other physically demanding jobs. Your ability to perform well is directly dependent on the amount of food you consume, and more importantly, the quality of that food and the energy it provides.

To the modern athlete or person living an active or athletic lifestyle the same challenge of getting enough high quality food still exists. Today, however, we know that it's not just about food intake, but in fact, the types of foods you eat, the nutrients they contain, the combinations in which you consume them, and even the timing of when you eat them, can all affect your physical performance, your ability to compete, and thus, your chance to win.

SUPPLEMENTS: HIGH POTENCY TO SUPPORT AND PROMOTE A HIGH-POWERED LIFESTYLE!

For the professional athlete, sports performance involves three phases; training, competition, and recovery. Nutrition plays important roles in all three phases. Understanding the needs and impact of each phase and how to best support the body as it goes through them has been a focus of sports nutrition research for decades. Recently however new discoveries about the roles of specific nutrients and groups of nutrients have helped take sports performance to new levels of understanding. Here are some key findings from the leading edge of sports nutrition science.

PROTEIN—TO BUILD, REPAIR, AND MAINTAIN MUSCLES

Muscles need protein! This is not a new idea, but one that science continues to validate over and over. Often, athletic performance comes down to building better, stronger, and more powerful muscles. Dietary protein intake and in particular, the amino acids that make up protein is critical to the growth and maintenance of healthy muscle tissue.

TIMING IS CRITICAL

When you take protein is important to muscle growth and maintenance. In the late 1990's and early 2000's repeated studies showed that ingesting an amino acid rich protein drink containing 6 grams of essential amino acids within 1-2 hours after heavy resistance exercise resulted in a positive increase in net muscle

protein synthesis.^{1,2} A 2008 study published in the *British Journal of Sports Medicine* affirmed that amino acids intake combined with quick energy carbohydrates within 30 minutes post exercise can result in an increase of protein deposition in muscles (i.e. muscle growth).³ This heightened state of protein metabolism following training or competition persists for up to 24 hours. It's important therefore to spread protein intake out across the entire recovery period for best results.⁴

The broader consideration of the importance of protein intake for athletes is clearly displayed in a recently published scientific review in the *Journal of the International Society of Sports Nutrition*. The latest research and scientific evidence supports the benefits of nutrient timing for protein.

Before Exercise

Intake of amino acids and protein before resistance exercise can maximize stimulation of muscle protein synthesis.

During Exercise

Ingesting a protein and carbohydrate mix during resistance training promotes increased muscle glycogen (the predominant muscle fuel), and helps offset muscle damage to facilitate greater training adaptation.

After Exercise

Post-exercise protein intake can enhance and even accelerate the replacement of depleted muscle glycogen and significantly reduce muscle soreness following exercise, especially if adequate carbohydrates are not readily available.⁵

SPECIAL AMINO ACIDS PLAY SPECIAL ROLES

Branched-Chain Amino Acids (BCAA's) are particularly important for athletes and “weekend warriors” when it comes to muscle growth and strength. Because of their unique structure, these amino acids are known to take the “fast track” to your muscles following exercise. One particular BCAA involved in muscle growth is leucine. As reported in the *Journal of Nutrition* this unique nutrient supports muscle growth and maintenance by not only helping build new muscle, but by decreasing the rate of muscle degradation.⁶ In a companion study, the BCAA's leucine, isoleucine and valine were also shown to promote mental focus and alertness.⁷ Benefits for BCAA intake have been shown for doses ranging from 3–16 grams.⁸

PROTEIN AND WATER—PARTNERS IN HYDRATION

It is important to stay properly hydrated before, during, and after exercise (training or competition). And the longer you are exercising the more important it becomes. An interesting twist in our understanding of hydration was investigated in a study that showed that protein in a sports-drink enhanced fluid retention and performance for athletes competing in an 8-day cycle stage race.⁹ In water alone, or mixed into electrolyte replacing beverages, protein helps facilitate rehydration and retention.

HOW MUCH PROTEIN DO YOU NEED?

There is no doubt that protein intake is key to the athletic lifestyle. But how much protein do you need? Depending upon your level and type of athletic activity and your body size, daily protein needs can vary significantly. The chart below shows that compared to a non-athletic individual, moderate athletic activity demands 50% more protein while highly athletic activity demands more than 100% and ultra endurance 150% more each day.

GNLD PROTEIN SUPPLEMENTS DELIVER ALL YOU NEED

There are 22 amino acids involved in human nutrition and each makes an important contribution to health, vitality, performance, and longevity. All GNLD protein supplements provide all 22, including the 8 that are essential for adults (and the 10 for children). They all also contain the 3 branched-chain amino acids: leucine, isoleucine and valine. Each single serving of GR² Control[®] Meal Replacement Shakes (mixed in water) delivers approximately 6.75 grams of essential amino acids of which 3.3 grams are BCAA's.

Each GNLD protein formula was developed under the guidance of our Scientific Advisory Board and is made from specially selected plant and dairy protein sources known for their high bioavailability. Each has a high PDCAAS (Protein Digestion-Corrected Amino Acid Score) making them a great choice for everyone from athletes to weekend warriors, as well as active growing children.

NUTRITION TO SUPPORT IMMUNITY

Suboptimal immune capacity, which can put the athlete at increased risk of infection and disease, is often a consequence of prolonged exercise and heavy training. The first observations of this effect were investigated more than a century ago in 1890.¹⁰ One hundred and twenty years later we have a much deeper understanding of this important impact of sport. We have learned that the negative effects of vigorous exercise on immune function cannot be looked at in isolation. We must also consider the influence of environmental and biological factors such as the interactions of the central nervous and immune systems and the role of nutrition in immune function.¹¹

When it comes to nutrition, athletes need to pay close attention. Inadequate nutrition can put them at risk of poor performance, loss of muscle mass and bone structure, and prolonged immune dysfunction (up to 2 weeks following an endurance race event), including impaired lymphocyte proliferative responsiveness—the ability to respond to an immune challenge.

In addition to assuring protein and essential amino acid availability during training, competition, and recovery (BCAA's in particular have been associated with immune function in athletes⁹), it's important to look at other food factors that influence immune capacity.

These include vitamins C, E, B-6 and B-12, carotenoids, iron, and zinc. Carotenoids, lipid soluble phytonutrients found in colorful fruits and vegetables, have been long known as immune modulators.^{12, 13, 14} When carotenoids are inadequate in the diet key markers of immune capacity, including NK (natural killer) cell and lymphocyte proliferative responsiveness are greatly reduced. Conversely when they are abundant in the diet those immune markers are amplified. Athletes on carbohydrate- or fat-restricted diets can

DAILY PROTEIN INTAKE RECOMMENDATIONS

| Activity level | Protein (g) per kg Body Weight | Protein (g) per lb Body Weight | Protein (g) for 55kg (121lb) person | Protein (g) for 80kg (176lb) person | Protein (g) for 100kg (220lb) person |
|----------------------|--------------------------------|--------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| Non-Athletic | 0.8 | 0.36 | 44 | 64 | 80 |
| Moderately Athletic* | 1.2 | 0.55 | 66 | 96 | 120 |
| Highly Athletic** | 1.7 | 0.77 | 93.5 | 136 | 170 |
| Ultra Endurance | 2.0 | 0.91 | 110 | 160 | 200 |

* More than 5 hours per week of athletic activity.

** Resistance trained athletes.

Source: Campbell B, et al. International Society of Sports Nutrition position stand: protein and exercise. *J Int Soc Sports Nutr.* 2007 Sep 26;4:8.

inadvertently omit many immune nutrient rich foods. In the case of dietary carotenoids, inadequacy combined with exercise-induced immune depression creates a wide window of vulnerability and risk of “athlete sensitive” diseases and infections such as URTI (upper respiratory tract infection) and poor performance.

GNLD SUPPLEMENTS FILL THE GAPS

GNLD offers a comprehensive range of powerful whole food antioxidants, sustained release B-vitamins, iron, and zinc. Our product Carotenoid Complex® has been the subject of repeated human clinical trials by researchers from the U.S. Department of Agriculture, showing it is highly bioavailable, provides powerful antioxidant protection to blood lipids and cell membranes^{15, 16} and has the capacity to boost immune function as much as 37% in just 20 days.¹³ It’s an excellent way for athletes to assure they get an abundance of these whole food immune boosters.

INFLAMMATION—NUTRITION AND THE PROTECTION CONNECTION

Inflammation is a reality for all of us—athletic, active, or sedentary—and more than we previously realized! The latest science has now made it clear that most of us live with persistent inflammation that increases our risk of disease and accelerates our rate of aging. This state is the result of a diet overloaded with pro-inflammatory components and deficient in anti-inflammatory nutrition. For the athlete, those who live an active lifestyle and those with physically demanding jobs, this is particularly important. The increased energy production associated with strenuous activity produces an increased inflammatory load as cells “rev up” energy production.

Additionally, the “friction” associated with the transmission of that energy through the muscular, skeletal, vascular, and respiratory structures further adds to inflammatory load.¹⁷ The more obvious symptoms of inflamed joints or muscles reflect broader and deeper inflammatory stress throughout the body. In addition to the disease and aging impact mentioned above, all of this reduces the ability to train, inhibits recovery, burdens immune capacity, and slows healing.

The prudent and sensible course for everyone and athletes in particular, therefore, is to pursue a diet that provides as much anti-inflammatory power as possible. That means less of the fat and sugar-loaded fast, processed, convenience foods, replacing them with whole grains, fruits, vegetables, nuts, legumes, and lean proteins, in particular, omega-3 fatty acid rich fish. Focusing on assuring a dietary abundance of omega-3 fatty acids can give big gains to the athletic individual.

OMEGA-3 FATTY ACIDS FIGHT INFLAMMATION AND PROMOTE HEALING

The unique group of whole food fatty acids known as omega-3s plays many important roles in the body. They are well known for their heart health benefits¹⁸ and, more recently, for their ability to lower the body’s inflammatory index, a measure of inflammatory load. New examples of the benefits of omega-3 fatty acids for athletes are appearing ever more frequently. A 2010 study

published in the *Journal of Science and Medicine in Sport* showed that omega-3 fatty acids can boost lung function.¹⁹ Another 2010 study pointed to their ability to reduce oxidative and inflammatory stress in lung tissue.²⁰ Sports medicine experts recommend daily intakes of 1-2 grams of omega-3 fatty acids for athletes to mediate muscle and joint inflammation.

An exciting new frontier of research is showing great promise in the understanding of the role of omega-3s in healing. Rapid and efficient wound healing is important to all of us, but for the athlete, healing is especially important. Throughout training and competition damage occurs to muscles and joints. And during contact sports, bumps, bruises, tears, cuts, and scrapes all need to be healed quickly. Fortunately, omega-3 fatty acids have been associated with everything from the promotion of healing simple damage such as blisters,²¹ to the repair of wounds to skin (cuts and abrasions),²² damage to the cornea, joints and muscles.²³ Just as dietary omega-3 inadequacy compromises healing, dietary abundance is now known to promote it.

GNLD OFFERS SUPERIOR OMEGA-3 SUPPLEMENTS

GNLD first developed and introduced omega-3 supplementation more than 30 years ago. Over the decades, investigation and development has improved our knowledge and technical capacities to deliver high powered omega-3 nutrition. Our product, Salmon Oil Plus™, delivers the synergistic benefits of all 8 omega-3s involved in human nutrition. Human clinical trials presented and published at major scientific events and journals have proven its ability to protect heart health²⁴ and lower inflammatory index.²⁵ The most recent clinical trial, a collaborative investigation conducted by omega-3 expert Dr. Karsten Gronert and GNLD SAB member Dr. Arianna Carughi presented at the 11th International Conference on Bioactive Lipids in Cancer, Inflammation and Related Disease showed that Salmon Oil Plus has the power to resolve inflammation, support healthy immunity, and promote healing.²⁶

NUTRITIONAL SUPPLEMENTS: KEY COMPONENTS TO MAXIMUM PERFORMANCE

The potential benefits of a focused nutritional program for the modern athlete are a reality. The frontiers of research continue to provide a deeper understanding of the complex connection between maximal performance and nutrition. Food, the nutrients it is supposed to provide, the forms those nutrients take, and the timing of their delivery become more important to success in sports and athletic performance.

As of January 1, 2010: GNLD Nutritional Supplements, including our vitamin, mineral, protein, and phytonutrient supplements, are guaranteed to be free of any substance currently banned by the National Collegiate Athletic Association, International Olympic Committee, and World Anti-Doping Agency.

ANTIOXIDANTS: ARE THEY GOOD FOR PERFORMANCE?

The role of antioxidants in sports performance has seen much investigation, and much controversy. Are they good for us? Do they make us run faster, jump higher, or lift more? The answer includes “Yes” “No” and “Maybe”—thus the controversy. The response “Maybe” is accurate because there are many things we still don’t know and more research is needed. The response “No” is accurate because there is no evidence that antioxidants directly affect performance and ultra-high doses may, in fact, do just the opposite. The response “Yes” is accurate because there is a good

and growing body of evidence that shows antioxidants can reduce muscle damage and delay onset muscle soreness which would result in more effective training, and thus, improved performance.

Vitamins C and E, Carotenoids, and Flavonoids have all been associated with a reduction in muscle damage and soreness. Not surprisingly, however, the latest evidence does not point to antioxidants in isolation, but rather in the complex combinations in which they exist in the brightly colored whole fruits and vegetables found in the human food chain. The takeaway message: Eat all the fruits and vegetables possible and fill the gaps with whole-food, human food chain supplements.²⁷

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