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Optimizing Athletic Performance

by Raymond Francis

When we exercise it promotes our healing, boosts our immunity, improves circulation, and enhances overall health. But prolonged and intense exercise, like that of high-performance athletes, can actually reduce immune function and damage bodily tissues. Athletes push their bodies to the limit, and this creates special needs that go beyond what a typical person requires. To optimize performance, you must give the human machine all the raw materials it needs for proper function, while simultaneously preventing exposure to anything that interferes. Extraordinary physical activity produces a special situation: An increase in physical performance demands more raw materials than sedentary activity; this same increase in activity creates a multitude of toxins which require even more raw materials to detoxify. Those who provide for these specialized needs will improve their performance, while minimizing damage to their health.

If you're chronically short even one single nutrient, you will get sick. That's a guarantee. Nutrients do not act individually, but in fact they all interact with each other. We need a precise daily mixture of at least 59 essential nutrients to maintain health. For the athlete, nutritional shortages lead to impaired physical function, performance below expectation, more injuries, and slower repair times. Unfortunately, numerous studies show that almost all Americans are short several essential nutrients. This has a catastrophic effect on health, causing today's epidemic of chronic degenerative disease and these nutritional concerns are especially important to athletes.

An Athlete's Best Friend and Worst Enemy: Oxygen

While exercising, a person uses 10 to 20 times as much oxygen as sedentary activity. Free radicals are produced during oxygen metabolism, which damage the body's cells. Exercise demands heavy oxygen input, and thus a large increase in free radical output. That's how it works. Antioxidant chemicals protect the body from free radical damage by neutralizing & minimizing these free radicals. Because of this heavy oxygen demand, the athlete's need for antioxidant chemicals is much greater than the needs of a less active person, and athletic activity in the absence of adequate antioxidants can cause significant damage. Free radical damage is a serious problem because the damage doesn't end when the exercise stops. Free radicals cascade into a chain reaction of cell damage lasting up to 20 hours after exercise. Much of the muscle soreness and inflammation after strenuous exercise results from out-of-control free radical damage. Be sure to get adequate vitamins A, C, E, carotenes, etc., as these antioxidants protect tissues from free radical damage during and after workouts. For athletes, this translates to less tissue injury and shortened recovery times.

Antioxidants are important, while our diets are staggeringly deficient. For example: The RDA for vitamin C is 60 mg. The average American gets about 114 mg, but recent research shows that at least 200mg are required. The Linus Pauling Institute recommends 5000 mg per day for the average person. The RDA for vitamin E is 30 I.U. per day. The average person gets about 9 I.U., but recent studies show that 400 - 600 I.U. are necessary for good health, while athletes appear to need 800-1600 I.U. per day. Since athletes need substantially more antioxidants than does the average person, supplementation is essential to maintaining health and performance.

Supplementation is Essential!

Vitamins and Minerals - The importance of supplementation was demonstrated by a study of marathon runners in a 20 day, 312 mile run. The test involved hemoglobin levels, a measure of the blood's ability to carry oxygen to the body's cells. One supplemented group (given vitamin supplements including iron, zinc, vitamins B6, B12, C, and folic acid) actually increased their ability to carry oxygen with higher hemoglobin levels, and this coincided with improved performance over the same period. The control group (marathon runners without dietary supplementation) had declining hemoglobin levels as the race waned on, and their athletic performance also deteriorated from excellent to marginal. It seems obvious that a decreased ability to transport oxygen would impair performance, and it does. Essential nutrients were used up by this intense activity, creating deficiencies. By the time day 20 of race rolled around, damage from lack of supplementation (malnourishment) becomes very evident in such things as an athlete's hemoglobin levels. The greatest amount of free radical damage to DNA occurs in men who heavily exercise without any supplementation.

CoQ10 - Muscle power is generated by conversion of the high-energy compound ATP (adenosine triphosphate) to the mechanical force of muscle contraction. Our bodies store very little ATP, so it must be generated continuously. You can't make sufficient ATP without CoQ10 (coenzyme Q10). CoQ10 supports every cell in the body by aiding in ATP production, as well as helping to prevent harmful lipid peroxidation—the harmful oxidation of fats— including cholesterol. 60 to 100 mg of CoQ10/day is recommended.

Ginseng - Certain herbs, such as Siberian ginseng, can be used to improve recovery time from exercise. Lactate is a by-product of anaerobic metabolism that causes muscles to function suboptimally. Expediting the clearance of lactate will shorten recovery time from exercise as well as allowing for more high-intensity work. A recent study at the Beijing Medical University Sports Research Institute found that athletes on an herbal formula with Siberian ginseng significantly improved their lactate clearance after two weeks of intense work.

Phosphatidylserine (PS) - A recent study at California State University at Chico measured the effects of 800 mg of phosphatidylserine (PS) on muscle soreness during two intense two-week training sessions. Cortisol is a hormone, which breaks down muscle tissue and produces muscle soreness. The subjects taking the PS had significantly reduced cortisol in their blood, less muscle soreness, and reported a marked increase in their feelings of well being. The study concluded that PS attenuates muscle soreness and reduces cortisol levels during recovery from exercise.

Another important nutrient is water. It is essential to keep well hydrated. Dehydrating a muscle a mere 3% causes a 10% reduction in performance. The quality of our tissues, their strength, performance, and resistance to injury, are all dependent on having an adequate supply of water. Lungs are 90% water, brains 76% and blood 82%. Since an athlete in heavy training can use over two gallons of water a day, dehydration an ongoing concern. Water is an extremely important nutrient, and it frequently gets forgotten.

Injuries, Infections & Immunity

Many athletes fail to reach their potential because of constant injuries. Healthy tissues tend to be more supple, stronger, and less susceptible to injury. People don't grasp the fact that immunity is linked both to the seriousness of an injury, and the time it takes to recover. Healthy tissues get injured less often, and recover more quickly. Athletic success requires not only good training, but also optimal nutrition and the resilience it provides.

Intense exercise reduces levels of glutamine and glutathione, both of which are essential to immunity. Reduction in glutamine and glutathione suppresses natural immunity for hours after exercise. That's why athletes are more susceptible to infection than the general population. A study at St. George's Hospital Medical School in London found that top level athletes often had severely depressed immune systems, and that they were especially vulnerable to viral infections. In marathon runners, infections cause more days lost than injuries. A third of all marathon runners suffered an upper respiratory infection within two weeks of their race. One Soviet Olympic skier, whose team was studied, had six infections in the five months after the Olympics. This observation caused the Soviets to shorten the length of the competitive season since immunity decreases with increased duration of intense activity.

The solution to the athlete's many special requirements is high quality supplementation: Vitamin E is an excellent antioxidant that can be used to minimize oxidative cell damage, thus helping to prevent injuries in athletes. Vitamin E can also help to protect the membranes of T-cells, thereby enhancing immunity. A study in the *American Journal of Clinical Nutrition* found that Olympic athletes who took 800 to 1600 I.U. of vitamin E per day, plus other antioxidants, during periods of training completed the three year study without a single infection. Most brands of vitamin E available today don't provide these heightened levels of antioxidant protection. Unique E is the only brand with high antioxidant activity.

Vitamin C is another important antioxidant. Its concentration in certain immune cells is 150 times the concentration in the blood. When fighting an infection, these cells use enormous quantities of vitamin C. If the C is lacking, immunity declines.

Caution

While supplements are essential to enhancing athletic performance, not all supplements are safe or effective. Careful selection of supplements is imperative. For instance, I would highly discourage the use of steroids, which have proven dangerous. Another supplement that is becoming increasingly popular with athletes is creatine. Creatine is recommended for athletes

who perform brief maximal exercise or repeated strenuous exercise. Creatine measurably enhances strength and increases repetitions. However, little is known about the long-term effects of creatine supplementation. There have already been reports of muscle cramping, tears and pulls, dehydration, gastrointestinal distress, and seizures. The FDA cautions that creatine should only be used under supervision by a physician. The best policy would be not to use it at all until more is known about its safety.

Conclusion

Superior athletic performance is the result of numerous mental, psychological, and physical factors. Purely looking at the human body as a machine, attention to diet, proper supplementation, and adequate hydration are absolute essentials. Athletes have special nutritional needs brought about by their own activities. Extra care must be taken in eating only those foods containing high concentrations of nutrients. This requires the athlete to be educated, and to make the consistent and deliberate choices that provide optimal performance. This means avoiding processed and prepared foods, which are low in nutrient content and high in toxic content. Even with a quality diet, a supplementation program is vital for optimal performance. This should include the basics of a high quality multiple vitamin/mineral formula: vitamin C, vitamin E, quercetin, extra calcium, magnesium, and zinc, beta carotene, essential fatty acids, and CoQ10. Proper diet and supplementation will allow athletes to have their cake and eat it too. Thorough training to exhibit superior performance without being slowed by the ill effects—way ahead of the competition.

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