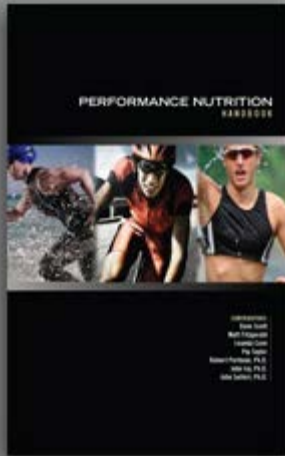




**"Must read for every  
endurance athlete"**

Dave Scott  
6-Time World Champion



► **FREE DOWNLOAD**

## PERFORMANCE NUTRITION HANDBOOK

Authored by leading athletes, coaches and researchers the free Handbook uses the latest science to show you how to create your own nutrition action plan.

NUTRITION *EDGE*



EDITOR: Dr. Robert Portman, a well known sports science researcher, is co-author of Nutrient Timing and Hardwired for Fitness.

## RESEARCH *YOU CAN USE*

### DAMAGE CONTROL

For many endurance athletes, pain is a point of pride. Competing through pain builds mental and physical toughness. What is often not realized is that during intense exercise your body releases cortisol. One of cortisol's primary functions is to break down fat and protein so that these macronutrients can be converted into energy. The breakdown of protein results in muscle damage. Another activity of cortisol is to raise the pain threshold. From an evolutionary perspective this is extremely logical. Our Paleolithic ancestors weren't concerned about exercise, but they were probably very concerned about outrunning predators.

A moderate amount of muscle damage produced during exercise is a positive. This permits the remodeling and rebuilding of stronger muscle. There is a great deal of truth in the saying "no pain no gain". The problem, however, is that excess muscle damage leads to no gain. Excess muscle damage places too great a burden on repair systems and they may not have sufficient time to complete the rebuilding process before the next workout. When that happens, there is a decreased muscle performance in the subsequent workout.

At one time, it was believed that one could not modulate the level of muscle damage that occurred during exercise. Studies now show that is not the case. Consumption of nutrient-rich beverages during exercise can significantly attenuate the level of damage during exercise. The research shows that the best sports drink is one that combines carbohydrate and protein in a 4:1 ratio. Researchers at James Madison University conducted an series of trials comparing the effect of a carbohydrate sports drink to a carbohydrate-protein sports drink. They found the carbohydrate-protein sports drink increased time to exhaustion by 29% compared to the carbohydrate sports drink and that the biomarkers of muscle damage were 83% lower after exercise when the carbohydrate-protein sports drink was consumed. Not surprisingly, reduction in muscle damage was associated with a 40% improvement in a subsequent workout performed 16 hours later. These studies show conclusively that damage control through nutrition should be an integral part of an endurance athletes training regimen.

## PERFORMANCE NUTRITION

### NUTRITION PERIODIZATION

As an endurance athlete, should you eat the same way 365 days a year? No! While you should maintain a consistently balanced diet based on natural, whole food such as fruits, vegetables, and lean meats, it's best to vary your eating habits in specific ways at different times—a practice known as nutrition periodization. If your current diet is not as healthy as it should be, you'll want to focus on improving the overall quality of your nutrition first. But if you are already eating healthy, nutrition periodization could take your training and racing to the next level.

There are three key dietary phases for endurance athletes. In the off-season you should maintain a diet that is moderate in carbohydrate and high in protein. That's because you're training less and not burning as many carbs, or

as many calories in general. Reducing your carb intake at this time will prevent you from gaining fat, while increasing your protein intake will help you eat less without hunger. During peak training, increase your carbohydrate intake to 4-8 grams per kilogram of body weight daily. This will ensure that you perform at your best in workouts and get the most out of them. Finally, in the pre-race taper period, be sure to reduce your calorie intake by about 500 calories per hour of training reduction to prevent last-minute weight gain.

## GENERAL NUTRITION

### **ARE YOU VITAMIN D DEFICIENT?**

Vitamin D has been much in the news recently and is a hot topic in medical and nutritional research. Recent studies have implicated vitamin D deficiency in connection with a host of diseases and health conditions, including some cancers. Scientists also now believe that vitamin D deficiency is far more widespread than was previously known.

A review published in the journal *Medicine & Science in Sports & Exercise* suggests that vitamin D deficiency may even impair athletic performance. Researchers from the Medical University of South Carolina and the University of North Carolina speculated that adequate vitamin D levels are need for optimal athletic performance because they increase the body's production of calcitriol, a steroid hormone that affects more than 500 different genes.

The main source of vitamin D is exposure to sunlight. One of the reasons vitamin D deficiency has become more widespread lately is that people aren't spending as much time outdoors as they used to, and when they are outdoors, they're often wearing sunscreens that block vitamin D synthesis. Many experts now recommend that people get 15 to 20 minutes of direct skin exposure to sunlight a few times a week to prevent vitamin D deficiency.

It's a good idea to get your vitamin D levels checked by a physician periodically. If they are low, you may need to take a vitamin D supplement (D3 is the preferred form), at least during the winter.



**Accelerade makes  
your hard work easier.**

PacificHealth Laboratories

The uncompromising pursuit of science