

# PEAK PERFORMANCE

Part Six  
in a Series by  
Dr. Fred Hatfield

## About Protein

Athletes and coaches have debated for years whether increased dietary protein improves athletic performance. Some athletes, especially weight lifters and body builders, consume large amounts of protein because they are convinced that it is necessary to produce maximal muscle strength and size.

Most scientists question the value of this practice. They argue that the recommended daily allowance for protein (.9 gram protein per kilogram of body weight per day) established by the National Academy of Sciences is adequate. This debate recently resurfaced in the scientific community when several new studies indicated that exercise can, in fact, promote significant alterations in how the body uses protein.

### Protein Metabolism

Protein metabolism is an ongoing process in the body. Its two aspects — protein production and protein breakdown — exist in a dynamic balance, resulting in maintenance of a constant body weight.

Muscle is the major depot of protein in the body. Any significant increase or decrease in the mass of body protein is likely to affect muscle protein and, therefore, muscle weight and strength will change accordingly.

Many misconceptions exist regarding exercise effects on protein metabolism. It is clear that exercise promotes a *decrease* in protein production that continues for several hours after exercise. Over time, this would result in a major loss of muscle mass and weight. Fortunately, this loss does not occur because the period of decreased protein production is followed by a period of increased production.

*Not allowing sufficient recovery time for this period of increased protein production between exercise bouts may explain how overtraining impairs athletic performance.*

Why would exercise cause accelerated protein breakdown? There are two theories. One theory is related to the use of protein as a fuel source for muscle contraction. Although it appears counterproductive for a muscle to derive energy from its own tissues, this is exactly what occurs. Muscle has the ability to use protein for energy, and in fact does so while in the resting state. Large stores of energy are present in the body in this form. It is known that the quantity of protein used as an exercise fuel seems to increase during prolonged aerobic exercise—such as long-distance running, swimming, and cycling.

A second theory about exercise causing protein breakdown is related to amino acids — specifically, maintaining an adequate supply of amino acids to ensure maximal rates of protein production. Normal growth is impaired when inadequate quantities of

Editors Note: We are fortunate to have Dr. Fred Hatfield share some of his insightful training ideas on achieving peak athletic performance without drugs. Dr. Hatfield is a prolific and creative writer of over fifteen books on weight training. After spending years as a track-and-field athlete, soccer player, gymnast, olympic weightlifter, and bodybuilder, Dr. Hatfield turned to the sport of powerlifting. He is known as Dr. Squat. His 1,014 pound Squat in Hawaii last year was another world record, one of many set by this champion of champions.

protein are consumed. The increased growth of muscle (hypertrophy) caused by regular weight training elevates the need for protein. But bodybuilders and powerlifters are cautioned that too much protein can be harmful — it can be converted to fat and stored. Too much protein can also cause dehydration and damage to the kidneys.

### Protein Requirements

Recent experiments suggest that athletes require more protein than inactive individuals. The recommended daily protein allowance has a margin of safety, but it is probably insufficient for people who train hard. Protein requirements may vary among different types of athletes, and may be different for females and males.

Hopefully, new requirements will be established that accurately reflect the protein needs of athletes. Until then, consuming dietary protein in excess of the recommended requirements must be approached with caution due to the potential hazards of excessive protein intake. Just because a little protein is good, it does not follow that three to five times more is going to be three to five times better.

Based on the experiments conducted so far, it appears that protein/amino acid deficiencies can be avoided if an athlete consumes 12–15 percent of his/her total energy (kilocalories) intake as protein. This

*Continued on page 66*

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## PEAK PERFORMANCE

*Continued from page 59*

approximates the percentage intake of most North Americans. Therefore, it is not necessary to increase the percentage of protein. Simply increase the absolute amount by way of the increased total kilocalorie intake that occurs when individuals are actively training.

Many endurance athletes do not consume this much protein because of the trend toward diets that emphasize carbohydrate. These athletes are correct to consume large amounts of carbohydrate because of its major role as an exercise fuel. However, they also need sufficient protein. For the endurance runner, additional protein is necessary to help repair damaged muscle fibers and to serve as a minor exercise fuel. A diet containing 75 percent carbohydrate, 15 percent protein, and the remainder fat would seem optimal for this group of athletes.

Weight lifters need sufficient dietary protein to ensure maximal gains in strength and size. Some studies indicate that gains are greater when protein supplements are used. However, objective information in this area is scarce, so we can only estimate the optimal level protein intake for weight lifters. A good guess would be 20 percent protein, 70 percent carbohydrate, and the remainder fat.

An average marathon runner in training (who weighs 150 pounds) typically burns as much as 7,000 calories in a single day. If 15 percent of these calories are comprised of protein, then his protein intake will be equivalent to 1,050 calories, or 234 grams of protein (one gram of protein equals 4.5 calories).

Computing likewise for a powerlifter weighing 220 pounds by burning only 3,500 calories each day (owing to a relatively sedentary life style and shorter training sessions), only 525 calories will be derived from protein. This figure is equivalent to 116 grams of protein, a figure which experience tells us is not enough to support the massive muscular growth necessary in the sport of powerlifting.

However, if 20 percent rather than 15 percent were used for the powerlifter, he'd be taking in about 156 grams — perhaps a more logical amount for his sport. I have never seen any marathoner take in a prodigious 234 grams of protein, nor even close.

Pound for pound, endurance athletes need more calories than anaerobic athletes. But it appears that the percentage of these calories coming from protein may vary by as much as 5 points.

### FOOTBALL DEATHS DOWN:

The number of football-related deaths dropped from 12 in 1986 to four during last season, according to a study by the University of North Carolina. All the deaths were on the high school level.

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