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Nutrition and the Athlete *Fueling Your Sport*

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Increased activity brought on by participating in workouts, training or competition requires extra energy intake. Dietary plans that provide the most efficient energy sources will help to fuel the athlete for success. A diet built around high levels of complex carbohydrates protein intake is the best approach.

Several factors influence the amount of energy that athletes need to successfully train and compete. The type, intensity and frequency of training as well as the size, age and sex of the individual are major factors that dictate energy needs. For example, "weekend" athletes who engage in short bursts of activity will have different energy needs than serious marathon runners who are intensely training.

Carbohydrates, fats and protein all provide energy for the body. The primary functions of protein are growth, maintenance and repair of body tissue rather than as an energy source. Using protein for energy is inefficient, expensive, and may lead to liver and kidney problems in later life. Carbohydrates and fats should be the energy sources to fuel the human body in all types of activity.

Carbohydrates

Carbohydrate-rich foods are the best fuel sources for athletes. Sports nutritionists recommend that about 55 to 65 percent of calories come from carbohydrates. Complex carbohydrates such as starches should make up the majority of carbohydrate fuel. Examples of starchy foods are breads, cereals, pastas, starchy vegetables such as corn and potatoes, and dried beans and peas. Fruits are also excellent sources of carbohydrates. It is important to eat a variety.

Besides providing energy, carbohydrate-rich foods such as grain and cereal products, fruits, vegetables, and legumes are excellent sources of fiber. Vitamins and minerals are abundant in many of these foods.

In an athletic event, carbohydrates are the initial fuel source. In short-burst, high-intensity events such as

sprinting, jumping and pole vaulting, carbohydrates provide 100 percent of energy. For longer events carbohydrates and fats are the energy sources.

The body stores limited amounts of carbohydrates as glycogen. Through physical training and a diet rich in complex carbohydrates, athletes are able to store more glycogen and to use its limited supply sparingly. The amount of energy available from glycogen storage is about 1800 - 2000 calories. When stores run low, athletes become fatigued and performance suffers.

Carbohydrate Loading

Carbohydrate loading (also called glycogen loading) is a technique that may help endurance athletes such as marathon runners, biathletes and triathletes. Although the original technique for carbohydrate loading produced detrimental effects, a modern adaptation of the technique provides better results. The technique does not benefit athletes who are involved in training or competition for less than 90 continuous minutes.

Modified carbohydrate loading allows athletes to eat their normal high carbohydrate training diet. In the final three days prior to competition, athletes push daily carbohydrate intake to 525-550 grams of carbohydrate or 65 percent of calories from carbohydrate, whichever is greater. This final push of carbohydrate will enhance glycogen storage within the body. Intakes above 500 to 600 grams of carbohydrate per day do not contribute significantly to muscle glycogen storage or athletic performance.

Carbohydrates During and After Athletic Events

When athletic events last more than 60 minutes, athletes benefit by eating carbohydrates during exercise. The extra fuel helps them stay competitive longer. Slightly sweetened beverages which contain less than 24 grams of carbohydrate per one cup (8 oz) may be used. Nutritionists recommend 50-60 grams of carbohydrates per hour to fuel athletes through endurance events. Fruit juices that are diluted one part juice to one part water or some sports drinks will do the trick for endurance athletes.

Following training or competing, it's important to eat complex carbohydrate-rich foods as soon as possible. After replenishment athletes can resume their normal high carbohydrate training diet. During training or competition, glycogen stores are used for energy and need to be replenished.

Fats

Fats, the other important fuel source, have over twice as many calories as an equal weight of carbohydrate. Aerobic training increases the body's ability to use fat as an energy source so that glycogen can be spared. However, fats cannot be used exclusively as a fuel. Some carbohydrates must always be available as a fuel source even in the best trained athlete.

Body fat storage will vary from athlete to athlete. Even in a fairly lean individual, there will be a good energy source from stored fat. For example, a 150-pound athlete who has 10 percent body fat has about 62,000 calories as stored energy. That's plenty of energy to fuel an athletic event over an extended period.

Since the body's fat storage is more than adequate to provide extra energy from fat it is not necessary to

get extra fat from your diet. In fact, a diet that is moderately low in fat (no more than 30 percent of total calories from fat) will not hinder performance and will promote an eating style that will be beneficial throughout life.

Carbohydrate Goals^a

<i>Ave. cal/day</i>	<i>Carbohydrate (g)</i>
1500	240
2000	320
2500	410
3000	490
3500	570
4000	650

^aCarbohydrate level will supply approximately 65% of calories.

Approximate Carbohydrate Values

Bread/Cereal Serving	= 15 grams
Starchy Vegetable Serving	= 15 grams
Fruit Serving	= 10-15 grams
Vegetable Serving	= 5 grams
Milk Serving	= 12 grams
Sports Drinks (8 oz)	= 10-15 grams

A serving of bread is 1 slice or 1/2 cup rice or pasta or 3/4 cup dry cereal.

A serving of starchy vegetable, fruit or cooked green or yellow vegetable is 1/2 cup. A small to medium fresh fruit is a serving.

A serving of milk is one cup.

Resources

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