

Eating for Peak Performance

Susan M. Kleiner, PhD, RD

THE PHYSICIAN AND SPORTSMEDICINE - VOL 25 - NO. 10 - OCTOBER 97

Nutrition plays a critical role in athletic performance, but many active people do not eat a diet that helps them do their best. Without a basic understanding of nutrition, popping a pill seems easier than planning a menu. In reality, there is no pill, potion, or powder that can enhance your performance like the right foods and fluids.

The Energy Diet

To *have* enough energy you need to *consume* enough energy. Getting adequate calories is one of the keys to an ergogenic, or performance-enhancing, diet. With too few calories you will feel tired and weak, and you will be more prone to injuries.

The ergogenic diet is based on the US Department of Agriculture's widely published food guide pyramid, which includes five basic groups: grains, fruits, vegetables, dairy foods, and protein-rich foods. Sugars and fats provide extra calories after the needs for foods from the other groups have been met.

By eating adequate calories from a variety of foods, you will satisfy your need for macronutrients (carbohydrate, protein, fat) and micronutrients (vitamins, minerals).

Carbohydrates. A high-carbohydrate diet increases stores of glycogen, the energy for muscles, and improves overall athletic performance. The bulk of the day's calories—60% to 70%—should come from carbohydrates such as bread, cereal, grains, pasta, vegetables, and fruit.

Different carbohydrate foods can affect your energy level in different ways. Digestion rates are expressed as a "glycemic index." Foods with a high glycemic index release energy into the bloodstream rapidly, while foods with a moderate or low glycemic index release their energy more slowly (table 1: not shown). (However, beware of the old idea that simple sugars are always digested rapidly and cause wide swings in blood sugar, and that all complex carbohydrates like bread are digested more slowly and don't cause blood sugar fluctuations. This turned out to be wrong, as the table shows.)

If you exercise for longer than an hour, you can begin to deplete your muscles of glycogen. By consuming 30 to 75 grams per hour of high-glycemic-index carbohydrate in liquid or solid form when you exercise, you can minimize this effect.

After a long workout or competition, your depleted muscle glycogen stores must be replenished, especially if you will be exercising again within the next 8 hours. Eat at least 50 grams of high-glycemic-index carbohydrate just after exercise, and consume a total of at least 100 grams of high-glycemic-index carbohydrate in the first 4 hours afterward. Moderate-glycemic-index foods may be added for the next 18 to 20 hours, with a goal of

consuming at least 600 grams of carbohydrate during the 24 hours after an intense workout or competition.

Fat. Fat is definitely an important energy source, particularly for athletes involved in prolonged, low-intensity activity. (For high-intensity, short-term activity, carbohydrate is the primary fuel source.) About 20% of the calories in a performance-enhancing diet should come from fat (1), most of it unsaturated fat like vegetable and fish oils.

Protein. Protein plays a minor role in energy production, contributing only 5% to 10% of the energy used during prolonged exercise. Although the current recommended dietary allowance for protein is about 0.4 grams per pound of body weight per day, most active people need slightly more. And athletes involved in heavy resistance exercise or prolonged endurance events may require 0.7 to 0.9 grams per pound per day. Even this amount is relatively easy to eat, since 3 ounces of fish or chicken, 1 1/2 cups of tofu, or 1 1/2 cups of garbanzo beans contain 20 to 24 grams of protein.

Vitamins and minerals. They don't contribute energy themselves, but vitamins and minerals are integral to food metabolism and energy production. Iron and calcium are the minerals most commonly deficient in athletes, and strict vegetarians may be deficient in vitamin B12. By consuming adequate calories and following the food guide pyramid plan, your needs for all the important micronutrients can be met.

Hydro Power

Water is the ultimate ergogenic aid—but because the body has a poor thirst mechanism, you must drink before you feel thirsty. Once you are thirsty you are already slightly dehydrated, and your performance will be diminished.

To stay well hydrated, you need to drink about a quart of caffeine-free, nonalcoholic fluids for every 1,000 calories of food you eat, assuming you maintain your weight. To ensure that you are well hydrated before you exercise, drink 2 cups of water or sports drink 2 hours beforehand. To avoid dehydration during exercise, begin drinking early and at regular intervals. For exercise lasting an hour or less, 4 to 6 ounces of cool water every 15 to 20 minutes provides optimal fluid replacement.

During exercise that lasts longer than 60 minutes, carbohydrate-electrolyte beverages containing 5% to 8% carbohydrate should be drunk at the same rate to replace fluid and spare muscle glycogen. Also, consuming sports drinks during intense activities such as soccer or basketball may enhance performance. After exercise, replace every pound lost during exercise with at least 2 cups of fluid.

The Ergogenic Future

The search for energy-giving food substances is widening. Alongside old standards like caffeine and herbal stimulants stand newly researched substances like capsaicin, the active ingredient in hot red chili peppers. One study showed that runners who ate a breakfast laced with 10 grams (about 1/3 of an ounce) of dried hot red pepper powder burned carbohydrates faster, both at rest and during exercise (2). These results are preliminary and tentative, but they raise the question whether designer ergogenic foods

may be in our future. Until then, you'll find the staples of your ergogenic diet in the food aisles of your local supermarket.