

HIGH-OCTANE EDIBLES

The right foods can make you a powerhouse By Pamela Weintraub

are bulldozed by snake oil salesmen pushing enzyme tablets that supposedly activate "special energy pathways."

But amid the confusion, legitimate diets to enhance energy have emerged. Physiologists are learning to manipulate fuel reaching athletes' muscles, just as pit stop technicians manipulate fuel in race cars at the Indy 500. By adjusting the carbohydrates, fluids and even the fats consumed before or during races, scientists can sometimes increase endurance

by 200 percent or more. Here's the best part: If you're an active person who works hard and exercises regularly or in intermittent bursts, much of this knowledge can help you.

Regular or Premium?

Before you can eat for optimal energy, you must understand your own body's needs. A new subcompact car may zip around on regular fuel, while an old station wagon might not get up a hill without unleaded supreme. Likewise, human bodies with large or inefficient systems must burn (or metabolize) more and higher-powered fuel for the business of life, while those

with small, efficient systems can make a little go a long way.

We all also have different levels of activity, from sedentary to intense. Skinny kids who run around like maniacs might easily consume 4,000 calories a day without putting on an ounce-they burn it up like wildfire to keep going. But a lethargic overweight adult should probably aim for around 1,000 to 1,200 calories a day (any fewer would neglect certain nutrients), with an emphasis on complex carbohydrates such as fresh vegetables and fruit; these foods burn away rapidly for quick energy. Highfat foods such as animal proteins, cakes and whole dairy products only make a heavy person more sluggish. For moderately

active people those who work in a day care

Ten years ago, Sulochana Kallai, then 46, "ate nothing but meat, meat, meat. I had no fruits or salads," she explains, "and all I did was work." Generally sluggish, Kallai, who gave facials in a skin care salon, was often out sick with colds, exhaustion and gastric pain. Then, in 1978, her husband died of a heart attack.

Suddenly aware of her own mortality, she started eating more carefully and began to run.

Slowly her energy increased; she ran further each day. This May, at age 56, she set the women's distance record in the 1,000-Mile Race. Kallai covered 631 miles before the 15 days allotted for the race ran out, an astonishing 42 miles a day. The now-svelte Kallai attributes much of her success to her new diet—whole wheat croissants, green leafy vegetables, potatoes, rice, pasta, legumes and plenty of water.

Not too many women run 42 miles a day. But whether you're climbing mountains or climbing the office ladder, nothing can energize you better than the right food. We've guessed that for decades, but often we've taken wayward nutritional paths. During the 50s and 60s, a woman on the go grabbed a candy bar for an energy buzz. In the 70s, health food junkies proclaimed the power of bee pollen. Even today, consumers center or take a beginners' aerobics • class—the best way to maximize

energy is to eat a balanced diet. Thanks to recent research, we have a better idea of what a "balanced" diet is. Basically, the balance has begun shifting away from high levels of fats and proteins, toward high levels of carbohydrates. Ann Grandjean, associate director of the Swanson Center for Nutrition in Omaha, Nebraska and consultant to the U.S. Olympic Committee, suggests a diet of approximately 60 percent carbohydrates (pasta, fruit, vegetables and whole wheat bread) for ready energy, 30 percent fats (olive oil, butter, margarine and mayonnaise) for long-term energy reserves, and only 10 percent protein (chicken, fish, dairy products and small amounts of lean beef) for tissue repair. For a woman of average height (5'5") and average weight (120 pounds), the total calories would come to about 2,000 a day. (Your doctor will steer you.)

Megadiets For Mega-events

The basic balanced diet may not be enough, however, for long or intense physical exertion. Though even dedicated runners and rock-climbers should usually adhere to the proportions of Grandjean's recommended diet (60 percent carbos, 30 percent fats, 10 percent protein), they may need considerably higher *calorie* levels—as many as 3,000 calories a day or more. Furthermore, by modifying the food proportions at specific times, they can dramatically increase their energy for an especially difficult bout of activity.

The 12 hours before extreme exertion are especially crucial. Whether you're entering a 10kilometer race, planning a 10-hour shopping spree or charging around a park with 10 kids all day, be careful about what you eat the night before. According to Sandra Rosenzweig, author of *Sportsfitness for Women*, this evening meal largely determines When we know enough about human nutrition, a 1000-mile race may be a breeze for everyone.

your energy the next day. "Go heavy on the potatoes, whole-grain breads, pastas, rice and other complex carbohydrates," she says, "but don't pig out so much that you gain weight. Eat very little fat, and avoid spices if

they give you indigestion, as well as gassy foods such as beans, cabbage,

broccoli and Brussels sprouts. Make this last dinner low on fiber by avoiding salads and raw fruits, because fiber eaten within 24 hours of hard exertion can cause diarrhea. If you still get diarrhea, next time cut out milk, coffee and the whole-grain breads."

Rosenzweig also advises that you salt the food moderately as you cook so you prevent heat exhaustion. But don't add salt at the table, or wolf down salty foods such as sausages; you'll retain enough water to make you heavy and slow.

On the *day* of your big event, says David Costill, PhD, head of the Human Performance Lab at Ball State University in Muncie, Indiana, eat three or four hours before the activity. (If you eat any closer to the time of the event, some of your blood may still be occupied digesting, leaving your muscles weaker.) The meal "should contain few fats and proteins, since they are digested slowly and do not provide fuels that can be readily used during exercise.' Instead, go for "a light carbohydrate meal of cereal, toast and juice." That combination will digest easily for quick energy, while leaving a minimum of residue in your stomach.

Grandjean suggests that when planning this pre-event meal, you consider its psychological benefits as well. Whether you're about to do an all-day swim or an all-nighter at the office, she says, "Stick with foods that you *believe* will help you. If you're deprived of the foods you associate with success, no matter how benign they may be, it could negatively affect your performance." Grandjean also suggests that you *share* this meal. "Eating

with

this meal. "Eating friends or fellow

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competitors can help you psych up or mellow out," she explains.

Carbo Conditioning

Emphasizing carbos for a meal or two is one thing: Carbohydrate loading takes you into a whole other realm. Scott Blum, a nutritionist and exercise physiologist at the Sports Training Institute in New York City, explains that carbohydrate loading means consuming an especially high proportion of complex carbohydrates (about 70 percent of your calories) for three days before a physically exhausting event of an hour and a half or longer. The classic use is for long endurance competitions such as marathons and triathlons; tens of thousands of Americans participate.

Contrary to popular belief, says Blum, carbohydrate loading doesn't mean stuffing yourself at three huge meals. Blum recommends five small high-carbohydrate meals each day, with a total calorie intake no higher than normal. The carbohydrates are stored in your muscles and liver as glycogen, a large molecule composed of smaller glucose molecules. *Glucose*, a simple sugar, is the fundamental carbohydrate for producing energy. As exercise goes on, glucose levels drop, and the glycogen reserves in your liver convert to glucose to provide fuel. But on a normal diet, says Blum, even glycogen reserves are depleted after an hour and a half and you hit the "wall," where your muscular systems slam to a halt. Carbo-loading, however, can protect you by increasing your glycogen stores.

Carbo-loading isn't as risky as it used to be, though. Ohio State exercise physiologist Edward L. Fox. PhD, got a whole generation of endurance athletes doing "stimulusdepletion" carbo-loading. Fox showed that you could triple your glycogen stores if you preceded your carbohydrate loading first with exhaustive exercise and then with three days of a diet high in protein and fat, including eggs, margarine, cheese and bacon. This depleted your system of glycogen, and when carbohydrates were finally introduced, the muscles soaked them up like a sponge. Continued use of the method, however, could result in kidney failure and heart disease.

Today's techniques are safer. When Blum recently participated in a biathlon—a 31-mile running and cycling event—he cut his training to a minimum three or four days before. Thus, while he was carbo-loading, he was using up little glycogen. In addition to giving his body rest, the technique left him extra glycogen for when the race began.

High-Powered Drinks

Even when you're not doing such mega-endurance activities that you need to carbo-load, you can get an energy jolt by consuming carbohydrate drinks during exercise. When Scott Blum did the running portion of his biathlon, he and his opponents quaffed H₂O every 15 minutes or so. But the bottle of water on Blum's bicycle had a kick: small amounts of table sugar. He was embracing an important finding from human performance research: Concentrated sugar packed into candy bars can actually slow you down, but modulated amounts of glucose during critical periods may increase energy by 20 percent.

According to some experts, though, in homemade glucose solutions the concentration is *too* low. One answer has been the more concentrated potions such as Gatorade. But Gatorade is like a liquid candy bar; Blum says the concentration is so high that the glucose cannot be completely absorbed. It sits in the stomach instead of entering the blood, leaving you bloated rather than energetic.

A couple of new sports drinks-Exceed, by Ross Laboratories, and Max, being test-marketed by Coca-Cola-tackle the problem. The energy-giving sugars in Max are less concentrated than body fluids, so it is absorbed rapidly into the bloodstream. Exceed is chock full of glucose polymers-molecular necklaces containing five molecules of glucose. Each polymer, or supermolecule, thus packs five times as much energy as a molecule of ordinary glucose. Even though the polymers are large, they are less concentrated and thus more easily absorbed than those in Gatorade-type drinks. Ross Labs claims that the extra wallop can extend endurance almost 75 percent.

For the most future-oriented exercise physiologists, modulating energy through food and drink is just the beginning. California biochemist David Cope, with IBM, suggests that when the athlete of the future marches to the sidelines, trainers will instantly test the levels of nutrients in the blood and the rate at which they are reaching crucial muscle groups. They will then inject the missing nutrients directly into the fatigued muscles. Other scientists suggest that we might one day reengineer the mitochondria, the cellular furnaces that burn food and turn it into our ultimate source of energy-a chemical compound called adenosine triphosphate, or ATP. If we can make the mitochondria more efficient, we might be able to produce more ATP for a given quantity of food. Either way, our speed, strength and endurance would increase terrifically. One thing for sure-once the complex pathways of human nutrition and metabolism have been sufficiently explored, the 1000-Mile Race will be a breeze for all of us.

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