BY JIM GERWECK

hot to trot

PRINCIPLES AND PRACTICES FOR RUNNING IN THE HEAT

If you can't stand the heat, get out of the kitchen" might be good advice for cooks and politicians, but for runners, it just doesn't work.

Many major, "can't miss" events are scheduled during the hottest times of the year, with this year's Olympic marathons in Athens perhaps the highest profile to be held under blazing temperatures. While optimum performance comes under cooler conditions, runners are like mad dogs and Englishmen and insist on racing in the midday sun. Given that many will either elect to do so, or, like the Olympic marathoners, have no choice in the matter, what are the best strategies and techniques for running in the heat?

The acknowledged expert in the field is Dr. David Martin (Senior Sports Physiologist, Australian Sports Commission), whose research on the effects of heat on exercise goes back to when athletes were preparing for the hot and humid 1996 Atlanta Olympics.

"The number one principle to remember is that you cannot accumulate heat," Martin says. Research has shown that the enzymes that produce muscular energy function best around 101 degrees, but go much greater than 104 or 105, and they don't work at all. "We live and exercise very close to the survival edge," says Martin. During exercise, 40 percent of the muscles' effort produces work, with the remainder simply generating body heat. For example, running at 7:30 pace produces 12 times more heat than sitting in a lawn chair sipping a cool drink. "That's fine on a cool day," says Martin, and it's what makes running possible even in near-Arctic conditions. "But when the weather gets warm, you have to get rid of that heat to continue to exercise effectively."

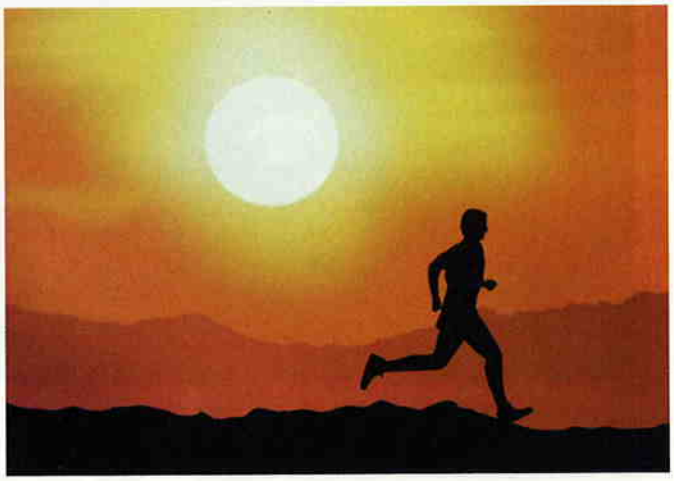
The body must dissipate this rising internal furnace, and the most effective way to do that is through evaporation of perspiration. Of course, the fluid for that sweat has to come from somewhere, and it's drawn from the blood plasma, which makes the blood thicker and more sluggish as it tries to supply the working muscles.

That brings up Martin's second principle: drink, drink, drink. "Your body can produce up to a liter of sweat an hour," he says. "It's hard to drink that much," but runners should try to keep hydrated during a run, then continue afterward until their body weight returns to its pre-run level.

By now, the process of acclimatization, or running in hot conditions to prepare for a hot-weather race, is well known, but it's not necessary to train in a sauna for months before a Fourth of July race. "Ninety percent of acclimatization occurs in 10 to 11 days," says Alberto Salazar, who ran beyond exhaustion in several hot races in the '80s and suffered a sub-par run in the 1984 Olympic marathon. "More than that can be counterproductive and actually wear you down, which is I think what happened to me in '84." Salazar now coaches a group of Nike athletes including Dan Browne, who will be on the U.S. marathon squad in Athens. "Dan won't go to Greece until about 10 days before his race," Salazar says.

What's more important is to get as fit as possible in cooler conditions, so you can handle the stress of racing in the heat. "The key is to try to build up your blood's hemoglobin levels before you acclimatize," says 1996 Olympian Keith Brantly, who grew up in Florida.

The acclimatization process should be gradual, slowly increasing the length of your hot-weather workouts. "Your body will begin to sweat, and therefore begin cooling, at a lower temperature," says Martin. "You'll lose more fluid, but it will be more dilute, with less electrolytes being lost. A good way to see if you're acclimatized is to lick your arm after a run—if it's not salty, you're adapting."



When it comes time to race in the heat, alter your strategy. Be aware of the relative humidity, which slows the evaporation of sweat. Try to run in the shade, since solar radiation can add 10 to 14 degrees to the effective temperature. And wear a hat and other light-colored clothing that reflects solar rays, since sunburned skin loses the ability to thermoregulate itself.

Finally, adjust your pace to the conditions, and realize that you won't run as fast as in cooler conditions, and if you try to, you may not finish. "Look at it as a fun day rather than one for all-out racing," advises Martin. He notes that every degree above the ideal racing temperature of 52 requires some adjustment, and speculates that the winning marathon times in Athens could be as much as six minutes off the world record. "It really opens things up," says Salazar. "The guys with the fastest times might not run well in the heat that day, which gives a lot more people a chance."