Ingestion of approximately 30-60 g of carbohydrate during each hour of exercise will generally be sufficient to maintain blood glucose oxidation late in exercise and delay fatigue. Since the average rates of gastric emptying and intestinal absorption exceed 1,250 ml·h^-1 for water and solutions containing up to 8% carbohydrate, exercising people can be supplemented with both carbohydrate and fluids at relatively high rates. When cyclists exercise at competitive intensities for 2 h in the heat with a sweat rate of 1,400 ml·h^-1, it is clear that the closer that fluid consumption matches sweating rate (at least up to 80% of sweating rate), the better. Increasing dehydration, due to inadequate fluid consumption, directly impairs stroke volume, cardiac output, and skin blood flow, which results in larger increases in body core temperature, heart rate, and ratings of the difficulty of exercise. This same phenomenon probably also applies to running, which argues against the notion that a certain amount of dehydration (i.e., up to 3%) is permissible and without major cardiovascular consequences. However, runners generally drink only 500 ml·h^-1 of fluid and thus allow themselves to dehydrate at rates of 500-1,000 ml·h^-1. The performance question boils down to “Will the time lost as a result of drinking larger volumes be compensated by the physiological benefits drinking produces and the faster running pace that might be achieved during the last half of the race?” However, if the goal is safety, which means minimizing hyperthermia, there is no question that the closer that the rate of drinking can match the rate of dehydration, the better.