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The Refueling Window

Maximize recovery with early eating

As a dedicated runner, you've most likely heard of the so-called "refueling window." Contrary to popular belief, this is not the US drive thru at your local Pizza Hut or Taco Bell. It refers to the benefits of rehydrating and refueling shortly after completing a training run or race. Runners of all ages and abilities can enhance the recovery process and reduce their risk of injury by wisely using the time immediately following exercise to refuel on carbohydrate-rich foods and beverages.

THE RECOVERY PROCESS

For most runners, whether preparing for a specific race or simply aiming to remain fit, consistency in training is the key to success. In other words, it means lacing up your shoes day after day and gearing up for high-quality workouts while minimizing time lost to chronic fatigue, injury or illness. Recovery, then, is the crucial process a runner must go through to return to a performance-ready state. Recovery involves restoring nutrient and fuel stores, repairing muscle fibers, and lessening muscle soreness and the irritability of the "brain fog" associated with extreme fatigue.

Research plus practical experience over the past 35 years clearly demonstrates the important role carbohydrates play in reducing fatigue and improving performance. Glycogen, the chief storage form of carbohydrates within the body, is constantly synthesized and degraded for energy as demanded. During exercise, glycogen, which is stored in limited amounts in muscles and the liver, is converted into glucose which fuels working muscles, as well as the brain (via blood sugar). When muscle glycogen and blood glucose concentrations are low, you will be forced to slow **down** and run at a much lower intensity as your body can only slowly convert body fat stores into energy during exercise.

Poor training days are often linked to poor eating days. Repeated bouts of daily exercise accompanied by a low-carbohydrate diet (40% or less of total calories) will produce a day-to-day decrease in muscle glycogen. It takes the body almost 24 hours to fully replenish muscle glycogen stores. Heavy or sore legs, a lack of your usual desire, and perceiving workouts and races as "feeling harder than they should." can all indicate **insufficient** recovery from prior physical efforts. Runners who exercise with low muscle glycogen stores also incur more nagging injuries.

THE CARBOHYDRATE WINDOW

Providing your body with the fluids and other nutrients it needs following exercise is the key to a speedy recovery. Diets that contain predominately carbohydrates (approximately 60% of total calories consumed) are crucial for runners who train daily, and especially for those who attempt double workouts or ultra-endurance events. The timing of your carbohydrate intake matters as well. During the

following exercise, the so-called "carbohydrate window" opens and muscles convert carbohydrate-rich foods and beverages into glycogen up to three times faster than at other times. Unfortunately, activities such as stretching, socializing, showering or jumping into the car to pursue other commitments often take precedence during this window of opportunity.

Peter Sherry, age 33, with PR's of 13:30 5K/2&10 10K and a 2:20:38 marathon debut at the 2001 New York City Marathon, runs 90 miles weekly, divided among 12 training sessions. In 1992, "I started looking for that extra edge, that would boost my results," claims Sherry. After morning sessions, Sherry now refuels with a large glass of a sports drink, followed by a smoothie made with fresh fruit, juice, rice milk and a protein powder. He follows up with additional carbohydrate-rich foods such as a bagel, cereal with milk, oatmeal or pancakes. "I make sure I eat all of this within 30 minutes of finishing my workout," says Sherry. In the afternoon, he times his run so he promptly sits down to a healthful dinner.

Exercise tends to elevate body temperature, which in turn can depress your appetite, so don't rely on hunger cues to prompt refueling, especially following prolonged or intense efforts. "I don't need to use any tricks to remind myself, I simply do it because it's an integral part of my training routine." says Sherry. To make it easy, keep a powdered sports drink in your

locker or desk drawer, or pre-fill a bottle and toss it into your car or have it ready and take it into the shower with you. Ease in high-carbohydrate foods, such as yogurt, fruit, a low-fat milk shake or **smoothie**, bagels, cereal or energy bars as **tolerated**.

You should consume at least one-half gram of carbohydrate per pound of body weight immediately following exercise. Numerous options abound in liquid form when you don't feel like eating immediately after exercise: sports drinks (14 to 19 grams per cup), high **carbohydrate** or meal replacement drinks (check the label. some provide, as many as 50 **grams/serving**), fruit juice (25 to 40 grams per cup), milk (12 grams per cup) or in a pinch, soda (40 or more grams in a typical 12-ounce can).

Evidence is now emerging that protein immediately following exercise may have benefits as well, by jump-starting the muscle building and repair process. Nevertheless, physiologists and sports nutritionists both agree that the hierarchy of needs **following** exercise remains the same—fluids first, followed by carbohydrates. then, relatively speaking, a small amount of protein. It certainly doesn't hurt to include protein, as found in some recovery drinks, energy bars, yogurt and milk, but another strategy is to include a quality protein at your next meal—eggs, meat, poultry, fish, beans, dairy or soy foods—within, one to two hours following exercise, *a*

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