

Get more out of Carbohydrates

By Rob Lockey, CSCS

Heading out on the bike, jersey pockets stuffed with gels, chews and bars, bottle filled with a favorite sports drink-you plot a course for the hills. As you get settled into the ride and start to consume the tasty treasures, conversion of food into usable fuel for the body begins. Have you ever questioned whether you are getting the most out of that fuel? Like miles per gallon in a car, drive it correctly over time and an improvement in mileage can be obtained. This enhancement is more miles for less cost. The human body is cable of similar changes in efficiency.

Carbohydrates (CHO) are one of three macronutrients the human body needs to sustain life, fat and protein are the others. When food in endurance sports is discussed, we usually only talk about fat and CHO as major fuel sources for the body. The contribution of protein as a fuel is minimal.

The human body is capable of processing fuels with (aerobic) or without (anaerobic) oxygen present. In aerobic processes, CHO are broken down with the use of mitochondria (powerhouse of the cell) and aerobic glycolysis, into the energy currency of the cell, adenosine triphosphate (ATP). This progression yields 39 ATP, which become the contractile components of the muscle. The anaerobic process of CHO is done outside of the mitochondria in the muscle cell using a much shorter sequence of the lactate system and yields a smaller amount of 3 ATP. The thing to take away from these numbers is that from the same amount of CHO the anaerobic method costs much more, much like having the gas pedal floored all the time.

Don't fret and think well I should never go anaerobic. Just follow these quick suggestions to create a more metabolically fit engine to do more work aerobically while feeding better when the anaerobic work is needed.

1. When the pace for the ride is designated to be of lower intensity, don't stuff yourself with food during the ride.
 - a. Instead eat a well balanced meal before and after the ride and drink water during.
 - b. Eating CHO at low intensity teaches the body to search for CHO over fat as a fuel, which isn't the path to metabolic efficiency.
2. When the pace dictates increased intensity, plan to eat while riding.
 - a. Still eat a good meal before and after; just add calories to the ride.
 - b. Time release is the best method, eat every 10-15minutes
 - c. Depending on your size and the intensity you will need up to 400calories an hour

Practice the above options every time you ride and over time you will find what works best for you to feel better doing the activity. The point is to maximize your body's ability to adapt and become more efficient with fuel.

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Aerobic vs. Anaerobic



Carbohydrate



Mitochondria (yields 39 ATP) ← with oxygen Pyruvate ← w/o oxygen Lactate system (yields 3 ATP)

Lactate Threshold

Slow pace →  → Fast pace