



Grub, sweat & fears: Hydration strategies for cyclists

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As summer rolls along many cyclists increase the length of their long rides and ride more weekly miles, compared to winter and spring seasons.

Summer brings increasing miles and increasing temperatures. Long, hot rides can cause problems if you don't adjust your fueling and hydration strategies.

The strategy that worked for you in the winter and spring on a three-hour ride in 40-degree weather will likely not work for a five-hour ride in 80- to 90-degree heat.



It seems that many athletes can make nutrition and hydration mistakes, and get away with them, for rides that are under three hours long. When rides increase over three hours, fueling and hydration habits become more critical.

In trying to figure out your personal fueling and hydration strategy for any length of ride, know that several factors complicate the solution.

Some of the complicating factors include intensity of the ride, the length of the ride, the past few weeks of training, current fitness level, current level of rest and recovery, fueling on and off the bike, hydration levels before and during the ride, electrolyte losses and replacement, heat acclimatization, plus other issues or combination of issues.

For this column, we will focus on fueling, sweat rates and hydration. A few numbers to get you thinking:

Fueling

Cycling burns about 0.15 to 0.17 calories per minute, per kilogram (divide your weight in pounds by 2.2 to get kilograms) of body weight, for fast riding. There is wide variation in this formula, but this gives you a start.

For example, 0.17 calories/minute-kilogram x 60 minutes x 73 kilograms (160-pound person) equals 742 calories needed for an hour of fast cycling.

For aerobic riding, the range is lower, around 0.10 to 0.15 calories per minute, per kilogram of body weight. Very easy recovery riding is lower yet.

To give you a frame of reference, on a mostly aerobic ride in lower heart rate zones, one of the local cyclists burns an average of 400 calories per hour as measured by a power meter. The rider weighs about 125 pounds. This works out to be around 0.12 calories per kilogram per minute.

How many calories this rider supplements during a ride depends on current fitness, what kind of training was

done in the week before the ride, breakfast volume and the length of the ride. For this rider, the supplemental calorie range is typically 150 to 400 calories per hour.

The rider adjusts the calories consumed on each ride, to suit the circumstances. Some of you reading this column are larger cyclists and burn up more calories per hour than the 125-pound rider, so this range may be low for you.

What is the maximum number of calories per hour the body can absorb? There is controversy about a maximum number; but it does appear that you can train your body tolerate a higher intake.

Some athletes hit a limit at 400 and others report numbers as high as 800 calories per hour. The kind of calories (solid or liquid, percentages of carbohydrates, fat and protein) does affect how many calories per hour can be tolerated.

Know that you do not have to replace all the calories you are burning during the ride, as some of the calories you use are provided by fat burning. However, the faster the ride, or the higher the intensity, the more glycogen you rip through and the more attention you need to pay to supplemental calories.

Heat and sweat rates

Your sweat rate and sodium-loss rates change with heat acclimatization. Acclimatization to heat takes about 10-14 days. Sweat contains about 0.8 to 2.0 grams (800 to 2000 milligrams) of sodium chloride per liter of sweat in a heat-acclimatized individual and 3.0 to 4.0 grams in a non-acclimatized individual. This formula is grams of sodium chloride per liter of sweat.

Sweat rates also vary widely due to several factors, including ambient temperature, humidity, genetics, fitness, exercise intensity and heat acclimatization. Sweat rates range from 1 to 3 liters per hour, which is a huge variation. These wide variations are why one person can drink one bottle of fluid per hour with 200 milligrams of sodium chloride and be fine, while another athlete gets into trouble on this pace.

I'm afraid I'll have problems again, what can I do?

Once you've had a bad experience during a ride, and we all have -- or will have if we ride long enough -- you want to do something so it doesn't happen again. I'll help you get started with a few tips:

- For fueling, a good baseline to begin with is 200 to 300 calories per hour. Consider bumping this number up if you are experiencing problems. If you have a very light, or zero, breakfast; begin consuming calories at the 20- or 30-minute mark at the beginning of the ride. If you had a hearty breakfast, you can begin refueling later in the ride, around the 60-minute mark.
- The easiest way to begin your personal experiment on fluid replacement is to weigh yourself before and after a ride to find out if you are having weight loss. Ideally, if you weigh yourself before the ride and consume enough fluid during the ride to prevent weight loss, you are supplementing perfectly.

If you weigh yourself before the ride and have a weight loss post-ride, this means you are sweating out more than you are replacing. It does appear that you can be somewhat dehydrated without causing problems, but losing over 2 percent of your body weight negatively affects performance, by as much as 20 percent. Start with a guideline of one water bottle of fluid per hour and adjust from there.

- If your clothes look like a salt mine after a ride and you feel "crampy" or notice performance declines during a ride not related to fitness or fueling, you may need to supplement with electrolyte tablets.

Electrolyte tablets often include sodium, chloride (sodium and chloride are "salt"), potassium, magnesium, calcium, iron and zinc. The major players are sodium and chloride. The secondary players seem to be potassium, magnesium and calcium.

Before supplementing with electrolyte tablets, look at the content label of your drink mix and know how many milligrams of electrolytes it supplies per serving. If you decide to supplement, begin with about 200 to 500 milligrams of sodium chloride per hour and adjust from there.

(Quick tip: A pinch of salt is about 100 milligrams of sodium chloride, and can help keep cramps at bay if you think you're heading for trouble. Eat a pinch, or two, of salt at your next refueling stop and be sure to drink about 8 ounces of water to dilute the salt.)

This column barely scratches the surface of all the issues, but hopefully it helps you begin your own self-experiment.

Pay attention to what hydration and fueling strategy works for you under what conditions, and be willing to make adjustments to your plan when conditions change.

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Gale Bernhardt was the 2004 USA Triathlon Olympic Team Coach and she traveled to the 2000 Sydney Games as the personal coach of a road racer. Endurance sports are her passion. She says training for these events help her train for life -- which requires tremendous endurance. You can find more information, including pre-built base fitness plans, race training plans and training books at <http://www.trainingpeaks.com/gale/>.

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