

I RUN, THEREFORE I “BONK”

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Have you ever been out on a “long” long run (more than about two hours) and hit a point where you are completely out of energy? We’re not talking about typical muscle fatigue, or that heavy feeling that comes from dehydration. Bonking is different. Bonking is when your energy to run is completely *gone*.

You never, ever want to bonk during a race, so it is important to understand what causes bonking and how to avoid it. At the same time, it is useful to know how to use it to your *advantage* during training. Yes, that’s right – you can *benefit* from bonking during training.

BONKING = GLYCOGEN DEPLETION

Your body’s two primary sources of fuel are fat and carbohydrates. Carbohydrates are stored in the muscles and liver as glycogen, and in the blood as glucose. Although glycogen is an extremely efficient source of energy, it has limited supplies in your body. The most highly-fit athletes can store only about 1,500 to 2,000 calories of glycogen at any given time.

When you run for two or more hours, your muscles will burn almost all of your stored glycogen, and perhaps *all* of it depending on your body size and your speed. At that point, with glycogen stores depleted or severely limited, your ability to continue running decreases markedly. Imagine trying to drive your car with little or no gasoline in the tank. It simply won’t go, and the engine begins to chug and sputter as the last drops of fuel are emptied. That is glycogen depletion, and that is bonking.

FAT FOR FUEL

It is true that your muscles can also burn fat for fuel, and that you’ve got plenty of that stored throughout your body. However, you have to “teach” your body to burn fat for fuel - while conserving precious glycogen - throughout your training.

If you are like most runners, your long training runs are usually done at a pace that is anywhere from 30-90 seconds slower than your goal race pace. The reasons for slower running are several, but one of the key reasons is the *adaptation* that is occurring when you run slowly.

At very low intensity, like walking or very slow running, your body burns fats and carbohydrates at rates something like this:

Fat 80%; Carbohydrates 20%

At moderate intensity, like **long runs**, it is more like this:

Fat 50%; Carbohydrates 50%

At high intensity (speed work, pace runs, racing), it looks like this:

Fat 35%, Carbohydrates 65%

On your faster training runs, your body is zipping through the carbohydrates very quickly. Compare that to your long runs, where the burn rate is about 50-50: your body is “learning” to burn fats instead of the more efficient, more preferred, and more limited supply of carbohydrates. That is one reason - and an important reason - why your long runs should be at a nice, comfortable, “medium” pace.

This training adaption is also why some coaches encourage runners not to use carbohydrate gels during “base” training periods. The base period is where runners are staying almost entirely in the aerobic training zones, with very little intensity. Thus, the “burn rate” of fats to carbohydrates is in the 50-50 range or better. However, when you use carbohydrate gels, you are basically giving yourself a “spike” of sugar, and your blood glucose level rises. In turn, your pancreas release insulin to regulate blood sugar. Insulin stays in the blood for up to two hours, **and hinders the body’s ability to use stored fats.**

Thus, a “shot of gel” is a “shot of sugar” which causes a spike in blood sugar, which releases insulin, which stops your body from doing what you are trying to “teach it” to do: burn fat for fuel.

Yes, you need gels in your races as a quick and efficient source of fuel. But you don’t want to rely heavily on them in your “base” periods of training. Instead, when your gas tank is empty on a training run – meaning your glycogen stores are depleted – your body is learning to use fat for fuel. Also, the more you slow down, the more your body turns to fat as a source of fuel.

By the time you hit your peak and race periods of training, you want to have already “taught” your body to use fat for fuel, and to conserve glycogen. During your pre-race taper, your body starts socking away glycogen in the muscles as you carbo-load. At regular intervals during your race, you want to consume carbohydrates - either in the form of gels or sports drinks – to keep the engine pumping.

PUTTING IT ALL TOGETHER

Stated very simply, the way to avoid bonking during a race is to:

- (1) train properly and sufficiently to teach your body to burn fat for fuel;
- (2) carbo-load prior to racing to allow for maximum glycogen storage; and
- (3) resupply your fuel supply during the race using gels or drinks that contain carbohydrates.

THE INTENTIONAL BONK

So, how can you benefit from bonking during training? The key is an immune system agent in your body called Interleukin-6, or IL-6, which is released into the bloodstream during exercise. IL-6 helps the body *increase* the rate of fat burn, and also promotes resistance to muscle damage. The primary trigger for the muscles to release IL-6 is glycogen depletion, i.e., bonking.

Studies have shown that the muscles produce *less* IL-6 when athletes consume carbohydrates during exercise. Moreover, it has been demonstrated that muscle endurance increases with regular (but controlled) exercise during glycogen-depletion.

This does not mean that you should intentionally bonk every weekend, or that you should completely avoid carbohydrates during training runs. However, during that occasional weekend run when you are completely out of gas, and feel as if you simply cannot run another step, remind yourself that your endurance is actually *improving* from the bonk, and that your body is getting a solid lesson on how to burn fat for fuel.