

Carbo-loading

How to do it right *(Hint: it's NOT a pasta feed the night before.)*

BY STEVE BORN

Ever since first research on the subject in the mid-60s, many athletes have adopted a variety of carbo-loading methods in the week prior to their race, in the hopes of obtaining an edge on race day. The key questions are: Does carbo-loading work and, more importantly, what do you need to do in order to gain the desired edge that carbo-loading—more appropriately defined as maximizing glycogen stores—will provide?

One of the most widely utilized carbo-loading protocols is known as the Astrand Method, named after the Swedish scientist Per-Olof Astrand. In this particular regimen, an athlete will spend the week prior to the event:

- Performing exhaustive, glycogen-depleting exercise for 1-2 days
- Doing easy workouts for the next 1-2 days
- Engaging in another 1-2 days of exhausting, glycogen-depleting exercise

During these days, the athlete consumes a diet containing only 10% carbohydrates, the purpose being that no glycogen replenishment can take place. For the final 1-3 days prior to the event, the athlete trains minimally, while consuming

an extremely rich (80%+) carbohydrate diet with a goal of increasing glycogen stores.

Unfortunately, there are a few problems associated with this particular regimen:

- When preparing for a lengthy event, the last thing you want to do the week prior is a workout that taxes your system (i.e., an exhaustive, glycogen-depleting workout). If you're not fit come the week prior to an event, there's little-to-nothing you can do to make positive influences to your fitness. Doing any lengthy, arduous training sessions in the week prior will only diminish your performance the day of the event, potentially even ruining it.
- If you're still training several days just prior to your event AND severely cutting back on carbohydrate intake as well, you can't replenish glycogen stores. Your body desperately wants those carbohydrates, but this particular method requires carbohydrate deprivation. As a result, no glycogen restoration occurs and your body is forced to burn fat and muscle. Burning a little fat isn't usually a major problem for most of us . . . unless, of course, you're doing a long-duration event, which is where the calories from fatty acid stores will definitely

come in handy, satisfying up to two-thirds of your energy requirements. Additionally, in the week prior to an event, burning lean muscle tissue is especially undesirable. Not only will you produce a ton of fatigue-causing ammonia even before the gun goes off, your body will literally be eating its engine long before you toe the line.

Other carbo-loading methods have come and gone. Research by Dr. David Costill is arguably still the most widely accepted protocol. In this particular regimen, the tough, glycogen-depletion workouts that the Astrand Method requires are not utilized (though I believe workout duration and intensity is still a bit high in Costill's protocol). Costill's main focus is on the percentage of carbohydrates one consumes. During the first 4-6 days prior to an event, carbohydrate intake comprises 50-60% of the daily intake. In the final 1-3 days, the percentage of carbohydrate intake increases to 70% of the daily intake.

Aside from exercising with any significant duration or intensity in the week leading up to an endurance event, I don't have a problem with Costill's protocol. My main concern is with athletes overconsuming calories in general (ditto for water and salt), under the belief that, "Hey! I'm a camel and I'm going to store all of this excess food, water, or salt. I'll be good to go!" Adopting this mentality is flat-out wrong, and far too many athletes have watched their efforts go down the drain, simply because they overdid it with food, water, and salt intake in the few days leading up to their event. Just as it's true when it comes to training prior to the event, if you haven't carbo loaded (i.e., maximized glycogen stores) during the weeks and months of training prior to the start of your event, there's little-to-nothing you can do to positively influence things. You can, however, throw a major monkey wrench into everything.

OK, I get it! What's the best way to carbo-load?

I'm convinced that the right way to truly carbo-load is to do it g-r-a-d-u-a-l-l-y. Think of it this way: When you start your training season, you don't bust out with super-long rides, hill repeats, and high-intensity speedwork from the get-go, do you? No, you do base miles and then gradually increase

the duration and intensity of your training so that your body becomes more accustomed to the stress you put on it, thus becoming fitter as the weeks go by. Additionally, you don't wait until the week before an event to start training, do you? Of course not! These principles can be applied to i.e. maximizing glycogen stores as well.

Maximizing glycogen stores – How it works and what you need to do

Along with insulin, which regulates blood sugar levels of ingested carbohydrates, an enzyme known as glycogen synthase converts carbohydrates from food into glycogen and stores it in muscle cells. This also drives the muscle repair and rebuilding process. However, to maximize recovery, you need to take advantage of glycogen synthase when it's most active. Carbohydrate and protein replenishment as soon as possible after exercise, when the body is most receptive, maximizes both glycogen synthesis and storage.

The process is easy; here's all you need to do:

- You train intelligently and consistently . . . NO training ("training" meaning exercise bouts of any significant duration or intensity) in the week prior to an endurance event.
- You "refill the tank" with high-quality carbohydrates and protein ASAP after ALL of your workouts in the weeks and months leading up to your event.

That's it! That's what carbo-loading is all about. It is NOT what you eat (or how much) in the week before the event, especially the night before. It is the replenishment of carbohydrates and protein in the first 60 minutes after ALL of your workouts in the weeks and months leading up to the event. Before you get out of your sweaty workout clothes, hit the shower, and then go horizontal to take a nap, "strike while the iron is hot" and put some fuel back into your body ASAP after each and every training session. Do that, taking advantage of the glycogen synthase enzyme when it's most active, and you will enjoy a huge advantage over athletes who either blew off post-workout refueling or waited too long to refill the tank.

Summary

Most carbo-loading techniques, especially the Astrand Method, are complex, hard to follow, and don't allow your body to fully recover prior to an endurance event. Additionally, while some of these methods may (key word "may") work for some athletes, there's no guarantee they'll work for you. Dr. Bill Misner states, "Carbo-loading does not work with predictability and may cause fat gain or gastric stress." With that in mind, why put your event in jeopardy by trying a carbo-loading protocol in the week just prior to the event, not knowing whether or not it's going to work?

A high-quality solid food meal or a recovery product such as Hammer Nutrition's post-workout fuels (Recoverite, Hammer Whey + a quality carbohydrate source, or Hammer Vegan Recovery Bars) will help you refill your tank, effectively replenishing and maximizing muscle glycogen stores. That, in my honest opinion, is the true definition of carbo-loading. The time to begin the process is now, even if your key events may not be happening for several weeks to months. I have no doubt that if you consistently follow my suggestions your body will thank you, and the improved quality of your workouts and event performance will be your proof. **HN**

References available upon request.

