



Refueling for Recovery

Endurance training is extremely taxing on your body's energy stores. Specifically, when undertaking intense training, especially over short periods, you may be in danger of reduced performance because of lack of muscle glycogen. Refuel to recover after each training ride to ensure you can perform at your maximum on your next training bout.

This handout is a simple overview of general refueling recovery strategies. THIS HANDOUT IS NOT A DIET PLAN.

Short Review of Muscle Glycogen

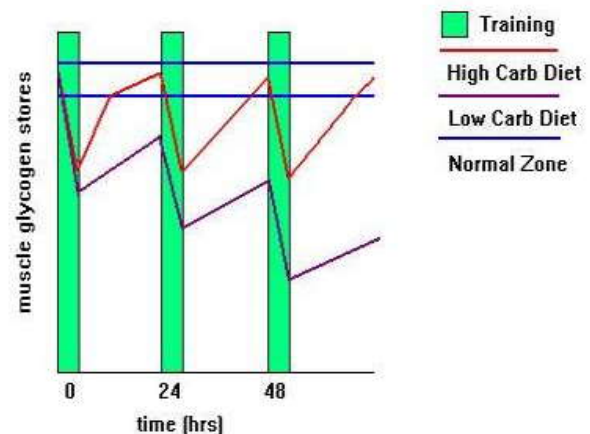
This section is the sister to the *Staying Fueled During Long Rides* handout, which covers fueling your body *while* riding. Please read that handout first. Then read this section which will cover *post-ride* fueling in order to ensure you start your next training bout with proper energy.

Neil Shirley, professional cyclist from the Jittery Joe's Professional Cycling Team has an excellent quote concerning fueling your body properly for training: "You are not eating for today, but eating for tomorrow." After a ride, many riders ingest calories with the assumption that they have wasted their stores and need to fill them back up quickly. This is a dangerous cycle to enter.

As you learned, in *Staying Fueled During Long Rides* eating while you are riding is essential to maintaining your blood glucose in order for you to remain energized enough to train properly.

You should never finish a ride feeling totally empty of fuel—yes, you may finish a ride feeling totally empty in the legs, tired in the lungs, exhausted mentally, etc, but again, never in a state of extreme hunger. Train yourself to overcome that hump first, then tackle recovery refueling.

This graph shows what happens to muscle glycogen over repeated bouts of exercise over repeated days:



Notice in the graph that training is the same over a 3-day period. Athletes ingesting a high carbohydrate diet (red line) are able to almost completely replenish their glycogen stores for the next exercise bout. Athletes ingesting a low carbohydrate diet (purple line) are unable to replenish their glycogen stores, and start the next exercise bout at a deficit.

This is a good time to review the graph in *Staying Fueled During Long Rides*, which shows the importance of muscle glycogen as fuel for up to 4 hours of endurance exercise.

General Recovery Refueling

As you are discovering, strategies for replacing your muscle glycogen are important. It should be noted that an entire diet of carbohydrates is not the answer, but a diet high in carbohydrates (between 60-70% of your daily caloric intake) is important to replenish your glycogen stores.

Follow these tips for refueling and regenerating after each ride:

- Immediately upon completion of riding, ingest ~300 calories of mainly carbohydrate with a bit of protein
- Shower, float in the pool, or sit in the hot tub for a half hour, ensure you hydrate for the entire period.
- One-hour post-ride, ingest an additional ~300 calories of mainly carbohydrates.
- Lie down or sit down with your feet raised, and take a nap for 30 minutes to 1 hour if possible.
- Ensure you eat a complete, well-balanced meal within 3-4 hours of ride completion, with the emphasis on carbohydrates.
- Ensure you attain 9-10 hours of sleep
- Eat a well-rounded breakfast, includes mainly complex carbohydrates and protein.

Immediate Post-Ride Refuel

Your post ride immediate meal should contain ~300 calories. There has been a bit of research which shows that a 4:1 ratio of carbohydrates to protein is the ideal composition of the calories ingested—meaning, the carbohydrates are absorbed more readily in the protein matrix. Yet, the main function of the post-ride refuel is just plain calories.

Ensuring that carbohydrates are the main source of those calories just makes sense, as can be seen in the graph on the first page. An energy bar is good choice for this immediate post ride snack, because usually you can get the right amount of calories with healthful ingredients.

Steer clear of processed sugars found in such items as candy bars. Steer clear of fats found in such items as potato chips. You want healthful fuels found in fruit, nuts, whole grains, and milk.

It may be beneficial to choose a recovery fuel that is liquid. I personally choose healthful recovery drinks, as made by a variety of endurance nutrition brands. A liquid may be absorbed more readily, may be easier on your stomach, and is certainly the most convenient, when you are exhausted after a long, hard training ride.

1-Hour Post-Ride Refuel

Your 1-hour post-ride refuel should contain ~300 calories. This meal should consist primarily of complex carbohydrates found in whole grains such as oats, bran, cereals, beans, pasta, and brown rice, to name a few.

Your muscles should have had time to absorb the less-complex sugars found in the immediate post-ride refuel. Now they need slower absorbing fuels to top of your muscles stores throughout the afternoon.

Once again, the real focus is on healthful calories, so do not get hung up on what exactly you are eating, as long as it is healthful. The above foods are suggestions.

Complete, Well-Balanced Meal

There is no specific calories guideline for 3- to 4-hour post ride meal, because being that this is most likely one of the main meals during the day, each person needs to eat to meet their personal calories demands. Attaining a metabolic test to ascertain your resting metabolic rate, and using a

calorie counter while riding, such as power meter, may help you dial in your exact calorie needs based on exercise.

For your 3- to 4-hour post-ride meal, choose a variety of foods to fill your plate. The advice of “eat a variety of fruits and vegetables” is never as poignant as when training at high levels.

Again, the main focus of your meal should be carbohydrates—I personally either include pasta or whole grain rice with every meal during heavy training.

Your plate should also have some lean protein—lean beef, chicken, pork, or as many including myself prefer, fish.

Finally, your plate should include an assortment of vegetables. There is an old adage that you should “eat every color of the rainbow, everyday.” Take this advice to heart, when sitting down to dinner. Have you had your greens? No, then order some healthy greens vegetables, such as broccoli or spinach. Have you had your orange? No, then order some carrots. These are not specifics, just guidelines—the key being a variety of foods.

It is important to note that you should never leave dinner “stuffed.” If you feel you need to eat until you are stuffed, because you are so hungry, then it is a sign that your earlier eating during the day (i.e. while riding, immediately after riding, 1-hour after riding) was not enough or the right foods.

You should leave dinner feeling sated, energized, and ready to tackle the next day’s training—that is after a good night’s sleep.

Breakfast

The morning is the best time to get your training day off to a good start. It may sound cliché, but breakfast *is* the most important meal of the day. Be prepared to start eating breakfast at least an

hour (better yet, an hour and a half) before the day’s training begins. I personally like to start a training ride a little full, because it forces me to complete a proper warm-up while I finish digesting—this is a trick that works for me.

Once again, there is no calorie guideline, being that everyone has different calorie demands. I personally shoot for ~800 to 1000 calories for breakfast. In essence, breakfast is most likely the biggest meal of my day.

For breakfast choose complex carbohydrates and some protein. Simple sugars will most likely leave you feeling empty as the ride progresses (e.g., lots of fruit juice). Fatty foods take longer to digest, and may not digest at all, providing a poor energy source. Large amounts of protein take very long to digest and the energy derived will only be used in dire situations by your body.

Items you can choose for breakfast include: whole grain breads and cereals, nuts and nut spreads, milk, and fruit. Again, a variety of foods, with the emphasis on carbohydrates.

Conclusion

Refueling for recovery is essentially a process of experimentation. Use the information in this handout as a start, and from there read more extensive and in-depth information, and experiment with what food combination work for you. The important take-away is refueling immediately post-ride, 1-hour post ride, and within a few hours of post-ride is essential. Also, starting your day of with a proper breakfast will set the wheels in motion for good recovery nutrition throughout your training day and week.

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