Lab Report: The Rest is Up to You

The Art and Science of Tapering

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This month's Lab Report looks at the art and science of tapering to improve your racing performance. After months of hard training in preparation for a key race, there comes a time when your focus should switch from hard work to allowing your body to recover and adapt so you are totally prepared as you approach the starting line. Let's look at why, when and how to taper.

The challenge in designing an effective taper is to find the optimal balance between continuing to train to improve your racing fitness and resting to eliminate the physical and mental fatigue of training. It takes discipline to appropriately cut back your training so you reap the full benefits of the hard miles that are already behind you. The benefits of tapering can be looked at as simply correcting the accumulated wear-and-tear of training. More specifically, it appears that tapering leads to improvements in running economy (how much oxygen you need to run at

a given pace) and muscle strength. This is not surprising because the cumulative fatigue of training reduces both of those. Tapering also allows repair of the ongoing microcellular muscle damage from training and full replenishment of the glycogen stores in your muscles and liver, as well as bolstering your immune system.

How much tapering will improve your performance depends on how hard you have been training and how you go about your taper. A review of over 50 scientific studies across a variety of sports found that tapering leads to improvements in performance of between 2 and 8 percent. In studies with runners, the benefit is generally on the order of 2 to 4 percent, which equates to about 60 to 120 seconds for a 50-minute 10K, or 3.5 to 7 minutes for a 3-hour marathon. If you are still not convinced that tapering is worthwhile, think about how many workouts you have done in preparation for your goal race. How much more improvement will you realistically gain from another tough long run versus the potential performance gains from a well-designed taper?

You should only do a full taper before a few key races each year. If you race frequently and do a complete taper for each race you will lose fitness because there will not be much time left to put in the necessary hard workouts. For most you can do a two- to-three day mini-taper, but for the ones you truly care about you need a thorough and well-planned taper.

The ideal number of days to taper depends on both the distance you will be racing and how hard you have been training. The harder you have been training, the greater the benefits of recovery. Too short a taper will provide less than the maximal improvement in performance, while tapering for too long eventually leads to detraining. The table below provides recommendations on how long to taper for various race distances.

Race Distance

Taper Duration	
Marathon	3 weeks
15K to Half Marathon	11-14 days
5K-10K	7-10 days

Art and science are of roughly equal value in designing your taper. According to the scientific evidence, the key to effective tapering is to substantially cut back the volume of your training (i.e., your mileage), but to maintain its intensity. Logically, reducing your mileage has the greatest impact on reducing accumulated fatigue to improve your racing performance. How much to reduce your mileage depends on your current training volume and the distance of your goal race. Guidelines for cutting back your mileage are presented in the table below. The art of the taper is using your judgment to optimize your taper based on your total training load, lifestyle and sense of how much recovery you need.

Race Distance

3rd Week Pre-Race	2nd Week Pre-Race	Race Week	
Marathon	20%	40%	60%
15K to Half Marathon	0%	30%	50%
5K to 10K	0%	20%	50%

Some running articles recommend increasing the amount of speed work during the taper. I believe that this is risky due to the high lactate levels from these types of workouts and the relatively long recovery times required. An approach that leads to more consistent results is to maintain your interval speed but reduce the volume of intervals. For example, if a typical long interval workout for you is six repetitions of 1K in 3:45, during your taper you would run the same pace per lap, but would reduce the session to three or four repetitions of 1K or perhaps four or five repetitions of 800 meters. This maintains the training stimulus but with reduced fatigue. To retain endurance adaptations such as increased glycogen storage and blood volume, marathoners should include a long run of approximately 1 3/4 hours two weeks before the race and 75 to 90 minutes about 7 days before their marathon.

There is also a psychological component to an effective taper. Leading up to a big race, it is paramount to believe in your training. That is why it is vital to adjust your taper to fit your individual needs. Keep a record of your taper leading up to each goal race and how you felt during them. Over time you will be able to identify patterns that will allow you to fine-tune your taper. As you line up for the start, you will then be confident that your taper has given you the maximal edge in performance. The rest is up to you.