Newsletter

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The Heart Rate Monitor

If you have a heart rate monitor or access to one you should be wearing it whenever you are training. That includes all aerobic and anaerobic training days. It is also a useful tool during races as it will allow you to pace yourself over longer distances or it can be used before the race to ensure a proper warm-up. On top of training, the heart rate monitor allows you to monitor your resting heart rate if you wish. This information can be used to monitor improvements in fitness, watch for signs of overtraining, or even warn you if you may be coming down with a cold or other illness. As you can probably see by now, using a heart rate monitor properly is like having a physiology lab at your personal disposal.

To train properly with your heart rate monitor you have to know where to set your upper and lower heart rate limits. This is especially true for your aerobic training limits. Most people make the mistake of setting their limits too high which puts them out of their ideal fat burning range. This is graphically illustrated on page 3; here we will focus on how to set your limits and use your monitor to it's full potential.

The best way to calculate your upper aerobic limit (i.e.-heart rate you want to stay under while training aerobically) is to use the 180 Formula. This formula works best because it factors in information about your current level of fitness as well as insuring that you stay in an aerobic, fat burning range. The formula works as follows:

Step 1- Subtract your age from 180, to this number make one of 4 modifications:

- If you have never trained before, are recovering from a major injury, operation, and/or illness, or are taking medication, subtract 10 from the number in Step 1.
- If you are currently exercising but not making gains, if your workout routine is inconsistent, or if you have suffered an injury (even a minor one) or if you have more than 2 colds or cases of the flu during the past year, subtract 5 from the number in Step 1.
- If for the past year you have worked out consistently (4 or more times/week) you have made gains in your fitness, and have not suffered any injury or experienced no more than 2 colds or cases of the flu, subtract 0 from the number in Step 1.
- If you compete and your performance has improved over the past two years, you have not suffered any injuries or experienced more than 2 colds or cases of the flu during the past year, then add 5 to the number in Step 1.

The number you have just calculated is the upper limit of your aerobic range. The lower limit can be found by subtracting 10 from your upper limit. This gives you a 10 beat range to train in while doing aerobic workouts. If this heart range is lower than what you are used to for aerobic training then you should expect to find this new pace slower than what you are comfortable with. Do not worry! Your body will quickly adapt and you will soon be running quicker aerobically than you ever thought possible. You can measure these gains in aerobic fitness by doing what is called a Maximum Aerobic Function (MAF) test. Every 3-4 weeks, run, swim or bike a measured route (1-2 miles running on a track works well) at or below your aerobic maximum. Time yourself and record the time. Compare with your time in 3-4 weeks and all subsequent times. You should see improvements in your mile regularly. You may not feel much faster as you continue to train in your aerobic range but the MAF test will let you know that you are improving.

As stated earlier, your heart rate monitor is more than an expensive wrist watch; it can be used during all aspects of your training. If you like to do your speed work on the track, then you can benefit from wearing your heart rate monitor. Let's say you are doing 400m repeats with 200m recovery.

How do you know if 200m is long enough for a recovery? How can you prevent a hard training session from becoming an overtraining session? Simple. Use your heart rate monitor. First, get rid of the idea of a set distance for recovery after each interval. You should base your recovery on how long it takes your heart rate to recover to your aerobic range before beginning your next interval. For example, Joe Triathlete has an aerobic range of 145-155 b.p.m. He's running 400m intervals and after his first interval his heart rate is 165 b.p.m. He jogs his recovery and after about 150m his heart rate dropped to 153 b.p.m He is now ready to do his next interval. For simplicity sake he waits until he's done 200m recovery so that he runs a lap from the middle of the track. Now, he had planned on doing 10x400m repeats, but after his 8th repeat he requires more than 400m to bring his heart rate down into his aerobic range. This is his signal that he's done as much training as his body requires to get in a good anaerobic workout. Anything more would not benefit him and might push him towards overtraining. So, as far as track workouts are concerned, use the heart rate monitor to gauge recoveries and also to signal when your body is getting tired. If a recovery lap is much longer than the distance of the interval itself, that's a strong signal that you've accomplished all you need to and you should pack it in for the day. Cool down and go home.

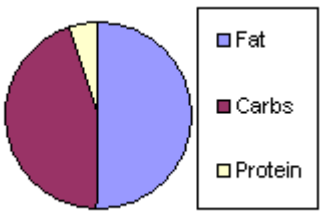
You can also use your heart rate monitor to measure your state of fitness and heath on a regular basis. As your fitness improves, your resting heart rate decreases. It's a simple fact that people who are fit have better conditioned hearts that don't have to beat as often when at rest. If you regularly measure your resting heart rate you can get some real insight into your health. Resting heart rate is best measured first thing in the morning before arising out of bed. Once you get up your heart rate goes up and you can no longer get as accurate a reading. Resting heart rate will also be elevated in response to overtraining, illness or even an approaching illness. If you regularly chart your resting heart rate and one day you notice that it is elevated it may be a signal that something is less than ideal in your training or your fitness. If you get an elevated reading, take it again the next day (the first one may be an aberration) and if it is still elevated you should then begin to look through your training log to see if you might be overtrained. If you can rule out overtraining then you may be on the verge of getting a cold. This would be a good time to take some extra rest in your schedule, take in extra fluids and vitamins, as well as try to eliminate other stressors in your life that may be contributing to a decreased immunity. Often you will have enough warning to avert any serious problems from an illness or from over training.

So as you can see, a heart rate monitor is a powerful tool which can be used in a variety of ways to improve your training. If you have one, take it seriously and use it as often as possible. This is the single most important tool in improving your fitness and competitive skills.

Aerobic Training

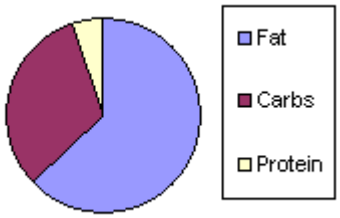
The purpose of aerobic training is to condition the body to burn fat efficiently as a fuel source during exercise. Now, even though you will be racing in your anaerobic zone, proper aerobic conditioning will be able to burn fats easier, therefore fats play a bigger role as a fuel source as your heart rate increases.

The formula we used to calculate your aerobic maximum heart rate is called the 180 Formula and it will actually set your aerobic heart rate a bit lower than what a treadmill test in a physiology lab might calculate. What you have to understand is that a lab calculation finds the heart rate at which you change primarily burning fats to primarily burning carbohydrates. You never burn only fats or only carbs, the two happen together. What we are interested in is training in the aerobic range which ensures that you are burning more fat than carbohydrate. That's what the 180 Formula will do for you. I've tried to outline this graphically below. All the values are fictional and are just to help illustrate my point.

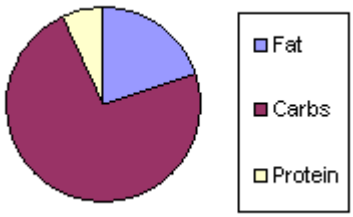


In the first pie chart we see what is happening just below your physiological aerobic max, as calculated in the lab. As you can see, at this point fats still outweigh carbohydrates as an energy source but they are pretty close to being equal. If you increase your heart rate much more beyond this point you will pretty much lose fat as a

primary energy source (remember that you'll never totally lose fat as an energy source because all three macronutrients are burned together during activity, just in different ratios).



In this second pie chart we see what happens when you do your aerobic training within the range calculated using the 180 Formula. As you can see, fats play a significantly larger role as an energy source. This is advantageous for many reasons; it helps burn off extra body fat, it conditions the body to burn fat efficiently and it ensures that fats are the primary energy source during aerobic training. While this pace may feel slower at first, you will quickly find that you are progressing to faster paces. Your aerobic improvement can actually be measured with the MAF test, as we discussed earlier.



Just for comparisons sake, lets look at what fuel source pie chart would look like as your heart rate approaches your anaerobic threshold. It should be quite obvious that fats are relegated to a secondary fuel source as carbs dominate at higher heart rates. But, if you become aerobically efficient you will see a carry-over effect because you will burn more fats at higher heart rates.