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## **Serious or Competitive Athlete Part 2 – Nutrient Timing**

This issue of the Healthy for Life Newsletter is going to focus on what type of macronutrients a serious or competitive athlete should be supplying to their body for maximum or optimal performance and when it should be consumed for optimal recovery—nutrient timing. Most individuals who are exercising are doing so to lose or control weight. In this case, it is best to just eat a healthy diet, establish a modest exercise program and provide cellular nutrition through supplementation (Healthy for Life Program located [www.releasingfat.com](http://www.releasingfat.com)). However, many amateur and even professional athletes are more concerned about peak or optimal performance. Therefore, in this issue you will learn how you can take advantage of the metabolic effects of exercise and nutrient timing to optimize muscle strength, growth and recovery.

Now I realize that athletes have different desires in regards to muscle size and strength depending on their sport. A ballroom dancer is going to have a different desire when it comes to the size of his or her muscles as compared to a defensive tackle. However, understanding the basic principles of nutrient timing will allow the athlete the ability to better achieve their goal of optimal athletic performance. The actual type of workout will have more impact in determining if your

muscles will increase in size, strength or both. Recovery from your workouts will be enhanced and your overall health will be better protected as you learn and apply these principles.

### **Metabolic Phases—Review**

#### *Energy Phase*

This was discussed in detailed in last month's newsletter. However, it is important to review some of the basic principles of energy production for the muscle cell. There is only a small amount of ATP stored in muscle cells and it is quickly used up when you begin to exercise. The muscle prefers to produce more ATP via the aerobic energy production system, which requires a constant supply of glucose and oxygen. When your blood glucose levels drop significantly, your muscle switches to the anaerobic energy producing systems. This is the CP and glycogen source of quick ATP production. However, as you may recall, the negative aspect of these systems is the fact that the end products of producing ATP by these methods is lactic acid. This eventually creates greater muscle damage and muscle fatigue. It also increases the levels of cortisol in your body, which is a catabolic hormone that depletes your immune system and slows recovery.

The ideal physiologic and metabolic state for the athlete who is involved in competition or an aggressive workout is to have a constant

supply of glucose along with adequate blood insulin levels. This allows the muscle tissue the best opportunity to remain primarily in the aerobic energy production and therefore avoid the anaerobic energy production as much as possible. Now depending on the intensity of your exercise activity, aerobic energy production just cannot keep up with the demand for ATP or energy for the muscle cell. The body will then call on the CP system or glycolysis for the quick production of ATP. However, it is important to realize that as your exercise intensity decreases or you are actually resting the muscle you can easily switch back to the aerobic system. The key is to understand that when the muscle has a continuous supply of glucose, which is the fuel source it prefers, your athletic performance is optimized. However, we now need to review what happens when you don't have that continuous supply of glucose and blood glucose levels begin to drop.

When blood glucose levels begin to significantly drop, the body will begin to break down fat and then eventually protein to provide fuel for the cell. Now as you may recall from my last newsletter, this is a much slower process and is not near as efficient of a fuel source as is glucose. Fat can only be used effectively for low-intensity exercise and it also requires glucose within the muscle cell to produce ATP. Muscle protein is also broken down into amino acids, which can also be used to produce ATP. However, this causes a significant amount of muscle damage and soreness because of the lactic acid this process produces. Therefore, during moderate to high intensity activity, if glucose is not readily available to the muscle, you will begin breaking down glycogen, which is your glucose storage in the muscle and liver. The problem is the fact that in this situation you will quickly use up your glycogen stores. Now you have to use fat and muscle to provide energy, which leads to increase in your lactic acid levels in your muscle. This will quickly lead to

muscle fatigue, prolonged recovery, increased muscle damage, and decreased athletic performance.

### *Maintaining Blood Glucose and Insulin Levels in the Optimal Range*

Athletes have been encouraged to consume what is referred to as high-glycemic carbohydrates in an attempt to maximize insulin levels. However, the medical literature is now showing us that when you spike your blood sugar levels by consuming high-glycemic carbohydrates that you actually over stimulate the release of insulin. This causes your blood sugars to drop as fast as they went up. Your blood sugars will then drop into the hypoglycemic levels especially when you are involved in an aggressive workout or competition. The low blood sugar levels then stimulate the release of our stress hormones like adrenaline and cortisol. Now you have created a situation that you so desperately wanted to avoid. These are known as the catabolic or destructive hormones. This causes decrease in your muscle function and recovery.

The answer is to actually consume what is referred to as low-glycemic carbohydrates along with good protein and good fat. Then your blood sugar will slowly increase as you modestly increase your insulin levels. Your blood sugar will remain in the competitive zone for a much greater time. Your insulin levels will be stimulated; however, not over stimulated. Therefore, your blood sugars will not drop into the hypoglycemic or low blood sugar range. This is the key to supplying a steady supply of glucose to the cell for aerobic energy production.

It is wise to consume a well-balanced nutritional drink that actually contains these good low-glycemic carbohydrates, good fats, and good proteins about 30 minutes prior to a workout or competition. If you are involved in a prolonged workout or competition, you can

even have an additional drink half way through your workout or competitive event. For example, if it is a basketball game, you could have an additional nutritional drink at halftime. In any event, you do not want to spike your blood sugar and be trying to compete when your blood sugar is going up and down like a rollercoaster ride.

### *Anabolic Phase—Nutrient Timing*

Once you have completed your workout or athletic performance, you now enter what is referred to as the anabolic phase. In the anabolic phase, your body is busy repairing any muscle damage and replenishing the depleted glycogen stores that were used during your workout or competition. Recent studies are showing that there is a window of opportunity that occurs just following exercise where you are able to enhance this process. There is about a 45-minute period of time following your exercise where the muscle is more responsive to insulin and the proper nutrients necessary for the repair and for replenishing your glycogen stores. If you provide the muscle with the appropriate balance of low-glycemic carbohydrates, good fats and proteins immediately following your workout or athletic performance, you can significantly increase the rate of muscle repair and glycogen storage. Following this window of opportunity the muscle is no longer as receptive to these important nutrients and insulin; therefore you do not see any significant enhancement of the recovery phase for the muscle. Now there are a lot of theories why this happens; however the studies consistently show that if you take advantage of this concept of nutrient timing, you can improve muscle recovery and strength as well as athletic performance.

Several clinical trials have shown that consuming a carbohydrate drink immediately following an intense workout improves insulin response, glycogen stores and protein or muscle synthesis. However, what is

interesting is the fact that protein may be even more important in providing the essential nutrients required during this critical time. In fact, studies that have combined the use of protein and carbohydrates at this time have shown greater enhancement of both glycogen stores and muscle repair. This has led many sports nutritionist to begin recommending that you consume high-glycemic carbohydrate/protein drinks shortly following (30 to 45 minutes) your intense workouts or athletic performance. However, as you are learning, I feel that there is a hidden danger of recommending high-glycemic carbohydrates that have been used in these clinical trials.

I personally believe that you should be consuming a nutritional drink that provides these good low-glycemic carbohydrates, good proteins (soy or whey or a combination), along with good fats (helps decrease inflammation naturally). You should consume this drink within 30 to no later than 45 minutes following your workout or competition. This will actually allow you to take even better advantage of this window of time where the muscle cell is more receptive to these nutrients.

### *Growth Phase*

The final phase is referred to as the growth phase. This phase involves the first twenty four hours to 3 to 4 day period following the anabolic phase. The type and intensity of the workout will determine how long it will take for your muscles to recover. If you are primarily involved in aerobic exercise, it may only take 18 to 24 hours to recover. However, if you are involved in intense weight resistant exercise, it may take that muscle 3 to 4 days to fully recover. Athletes that are primarily involved in weight resistant training in attempt to build muscle size and bulk are learning that they have better results if they only exercise a particular muscle group once or at the most twice a week. The reason for this is due to the growth phase. If you do not allow the muscle time to fully recover, you would be tearing it

down again before it had a chance to go through this complete growth phase. It is critical to understand that a muscle that has been damaged during your intense exercise will become stronger the more it is being rested. Repeatedly tearing down the muscle before this can happen defeats your purpose of building size and strength.

Now if you are primarily involved in aerobic exercise, your muscles would obviously be able to recover much quicker. This is why those individuals who are involved primarily with aggressive aerobic exercise are able to workout day after day. However, I still recommend that these athletes still give their body a rest at least once or twice a week. Ideally, it is a good idea to only workout 5 days per week.

## Conclusion

I have covered a lot of scientific principles to illustrate the importance of providing the proper macro-nutrition to the muscle for optimal performance. The goal should be to have ideal levels of glucose and insulin available to the muscle cell during and following your workouts or competition. This gives you the best opportunity to optimize your performance and recovery. The athlete also needs to become very knowledgeable about which foods can spike his or her blood sugar. It is not possible in a newsletter to completely present this information. I would strongly encourage any of you to get a copy of my book *Healthy for Life* to learn more about these important concepts. You could also consider joining my 6 month program for the Serious or Competitive Athlete located at [www.releasingfat.com](http://www.releasingfat.com).

I also feel that it is critical for the serious or competitive athlete to be taking high quality, complete and balanced nutritional supplements each and every day. There is a tremendous amount of excessive free radicals

produced during an intense workout. In order to protect your overall health as well as your athletic performance, taking nutritional supplementation is critical. Therefore, I will be addressing this issue in my next newsletter.