

## **Winter Techniques for Healthy Body Mass**

By Dario Fredrick

It's that time of year again, when many endurance athletes find the combination of holiday meals and less-friendly weather as challenges to maintaining optimal body weight. The desire to be thin is not limited to the appearance-conscious and supermodels. Many cyclists see the advantages of carrying less weight. Lowering body weight can improve climbing performance by increasing power to weight ratio. A lower body mass can also reduce the required power to accelerate to a given speed. However, does this mean that skinnier is necessarily better?

Unless power, fitness, efficiency and health are maintained, simply losing weight will not help. Optimizing body composition can help improve performance in cycling, but only by reducing body fat and non-essential muscle mass, and by maintaining essential muscle mass and power output. Most important is to maintain health. Without strong immune function, recovery from training and racing can be impaired. Significant caloric restriction can lead to problems with recovery, quality of training and even reduce resting metabolic rate.

There are a number of ways to optimize body composition during the winter while maintaining health and improving fitness. Each recommendation may be subtle, but putting them all together can make a difference.

### **Training**

Fat can be used as fuel only via aerobic metabolism. While we are always using a combination of aerobic and anaerobic metabolism to fuel work, and the proportion of aerobic contribution is maximized at low to moderate intensities. To stimulate maximal fat utilization during training, keep the intensity between ~70-85% of Maximal Steady State (30 min performance threshold heart rate) for as much time as possible. As the duration of your ride increases at that intensity, and if you stay well-fed with carbohydrates, the proportion of fat used as fuel increases.

Aerobic metabolism is most efficient at moderate body temperatures when oxygen is readily unloaded from the blood to working muscle. Oxygen is transported through the body by red blood cells. It is attached to the hemoglobin in red blood cells by a bond that is affected by temperature. The cooler the temperature of the blood, the tighter the bond. When the body warms up the bond is weaker and oxygen is more easily unloaded to the muscles. Without sufficient oxygen, maximal fat burning is impaired. Starting out warm and staying warm throughout winter training rides can help. Staying well-hydrated during winter training is also advantageous. Maintaining blood volume through proper hydration allows the body to regulate temperature more effectively, improving oxygen delivery. Although thirst tends to be less stimulated in colder weather, it does not diminish the importance of consistent fluid intake. Smart gear choices and hydrating well can enhance the quality of training, increase fat burning, maintain health and simply make you more comfortable on rides.

### **Nutrition on the Bike**

The metabolism of fat is most effective if there is carbohydrate available to maintain quality, highly aerobic work. The aerobic energy pathway becomes limited in its ability to deliver energy (especially from fats) if glycogen stores are depleted. If carbohydrate is not ingested during training, the muscles burn through the limited glycogen stores more quickly. Fasting while training can lead to premature glycogen depletion and the breakdown of muscle protein which can reduce your power output.

Finishing a training ride during which you have stayed well-fed will also reduce the potential to overeat in the post-training hours. The body will defend itself from a fasted state in training by over-stimulating the hunger mechanism to compensate and store more fat. Consider that most 150 lb. amateur racers will burn at least 500 calories per hour during training. For rides lasting more than 1.5 hours, eating at least one energy bar per hour will help sustain the quality of training, help to burn more fat and maintain muscle mass.

## **Nutrition off the Bike**

Glycemic index (GI) ranks carbohydrates by how they affect blood glucose levels at rest. A high GI rating would indicate a large and immediate rise in blood glucose from ingesting that particular carbohydrate alone. The response to this increase in blood glucose is a large insulin production. Glycemic load is similar to glycemic index, but takes into consideration the serving size of the food. Typically, foods with a higher glycemic load stimulate a greater insulin response. Insulin is an important hormone that regulates the entry of fuel (glucose) into cells of the body. When a large amount of insulin is released, glucose in the blood is quickly transferred into the body's cells, immediately reducing blood glucose. We have all experienced low blood glucose, where concentration is impaired, energy levels drop and hunger is stimulated. Eating high GI snacks alone are not advisable, except immediately following a ride when glycogen repletion is stimulated and bypasses the insulin response. Combining protein or fats with high GI carbohydrates tends to reduce their glycemic effects.

Eating the right balance of carbohydrates, protein and fats will help develop and maintain optimal body mass. Extreme diets tend to result in extreme fluctuations in health and energy levels. For example, very high protein diets are not appropriate for athletes, as they deplete glycogen stores and adversely alter the body's pH. The maximal range of daily protein intake for endurance athletes varies depending on training loads from 1.1-1.7 gm per kilo gram of body weight (divide your weight in pounds by 2.2). Depending on training loads, carbohydrate intake should be between 55-65 % of total calorie intake while fats (an essential part of one's diet) should not exceed 30 % of total calories.

If your goal is to lose weight through calorie restriction, be sure the deficit is small (~100-200 calories per day) or metabolic rate, recovery and energy levels can all be adversely affected. Staying well-hydrated can also help. The hunger and thirst mechanisms are sometimes confused in the body, especially during periods of high volume training. The next time you feel hungry, drink a glass of water then reevaluate hunger. This may reduce the potential to overeat if hydration is neglected. Fine tuning each of these nutritional values and proportions is an individualized endeavor. Consulting with a sports nutrition specialist can help you develop balance in your approach.

## **Summary**

Stay warm while training in the winter, ride at low to moderate intensity for multiple hours and stay well-fed on the bike. Eat a balanced diet, avoiding simple carbohydrate snacks (except post-training), and include sufficient protein without excessive fats in your diet. Drink plenty of water on and off the bike, and give yourself time to digest dinner well before going to sleep. While these recommendations may seem simple, when applied together they can help optimize body mass without having to make severe changes. If calorie counting is appropriate for you, or if you need help in evaluating your nutritional habits, consult with an experienced sports nutritionist. Altering your diet should be done in small increments that are more readily assimilated. Smaller changes allow the body to make more gradual, longer-term adaptations, resetting the balance-point of body composition. With these simple choices, your body composition should develop naturally to its optimal level, and your performance will reflect the balance.

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