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Eating and Drinking During Training

An endurance athlete should always strive to get the most out of her workout. In order to do this, an athlete would presumably want to train at her best, with the fewest limitations, throughout an entire training session. Then why is it that so many athletes insist on not eating or drinking during exercise sessions lasting longer than 1.5 hours?

The human body can not sustain ideal performance levels for longer than an hour without some form of nutrition or water intake. A person's individual needs during an endurance sport vary. However, there are general guidelines during training that everyone should follow, because no matter an individual's needs or preferences, every endurance athlete shares basic metabolic requirements during training. What are these? The holy trinity of **Hydration**, **electrolytes** and **calories**. The lack of any of these three vital nutritional components can result in an immediate, as well as long term, decline in performance.

Hydration. Hydration is unarguably the most important part of the nutrition trinity for endurance athletes. Without proper hydration, it won't matter whether an athlete maintains his or her caloric intake. The lack of water makes it virtually impossible for him to maintain electrolyte balances in the body. Water, as all athletes know, plays an important role in the body, but what happens if you don't get enough water during training?

Dehydration can take effect as soon as 20 minutes into training. This has an immediate effect on performance. A 1% loss in body weight during exercise due to water loss can result in as much as a 5% decrease in performance. More specifically, the loss of 1.5 pounds of water weight for most people (which happens within the first hour during normal training conditions) can result in a 5% slower time in one's time trial. Now imagine going 5% faster and harder during your second hour of training! That can result in a huge difference in your ability to train and race.

Water intake also allows blood to remain thin during practice. So why does that matter? When you become dehydrated, water is taken out of the volume of your blood plasma, the substance in which red blood cells are suspended.

Dehydration leaves less plasma and more blood cells, making your blood more viscous, or less able to flow easily. This means that your heart has to work harder and beat more frequently, increasing your heart rate (HR) and limiting how hard you can exert yourself. It also means that your blood can't clear away lactic acid, as it normally does. So not only do you feel more pain, but you increase your chances of cramping due to lactic acid build up. So how much water does an

endurance athlete need? Under normal training conditions, 12-16 ounces of water is considered adequate and necessary per hour of training.

Electrolytes. Electrolytes are related to water intake. Electrolytes such as sodium, potassium, and chloride are vital in order to maintain a proper pH balance of minerals and solutes in the blood. What does this mean? If your blood's concentration of electrolytes is out of balance, oxygen use and efficiency is decreased, muscles contract with greater difficulty, and water and other vital nutrients are not easily absorbed. Sodium is the only electrolyte proven to be beneficial to be taken in *during* exercise. Potassium loss during exercise is considered minimal, and doesn't necessarily need to be replaced *during* exercise. However, the intake of these electrolytes hasn't been proved harmful. Either way, it is important to take in the whole range of electrolytes more than a half-hour before, and especially after, exercise to make sure you maintain proper electrolyte levels.

Calories. The body can store only limited amounts of carbs. Heavy endurance training of 1-1.5 hours can deplete glycogen stores (glycogen is the stored form of glucose). In fact, glycogen store depletion can happen in as quickly as 15-30 minutes during intense anaerobic exercise. Glucose is what is actually used to produce the energy required by your muscles to contract. If an endurance athlete runs out of glycogen stores from the muscles, the body will search for additional stores in the liver, where glycogen is stored for vital process of the body, such as brain function. If you start to run out of the glycogen in the liver,

you will eventually impair brain function. This actually happens when someone “bonks”, a term familiar to many endurance athletes. Bonking actually happens when someone’s blood sugar (which is glucose in the blood stream supplied by the liver) gets so low that not only can their muscles not function properly, but their brain can no longer properly function. A person who bonks typically cannot hold a continuous conversation and tends to only be able to think about a particular food, usually a food high in *carbohydrates*! This can happen in as little as 2.5 hours of *low to moderate intensity* endurance exercise. Bonking can occur even more quickly during higher intensity exercise.

So how much should one eat during training? An intake of 200 calories of carbohydrates each hour, after the first hour of training, is ideal. This is best done with mainly simple sugars so that calories are absorbed quickly. It is also a good idea to incorporate either fructose (a more slowly absorbed form of simple sugars) or complex carbs during exercise as well, so that there is a consistent and steady flow of carbs into the system.

Don’t want to upset your stomach? Carbohydrates, especially in liquid form, move through the stomach and into the intestines, where they are digested rapidly. Solid forms of food need to be broken down and turned into liquid form before continuing into the intestines, which is where some people experience trouble with upset stomachs during intense training. Also, keep in mind that carbs are less likely to have a negative effect on your stomach during exercise than protein- or fat-based foods. It is best to combine carbohydrate intake with liquids. Aim for a ratio of 28 grams of carbohydrates per 350 ml of water. Carbs consumed at this ratio can be absorbed as quickly as water.

Tips

- Combine carbohydrate intake, liquid or solid, with water intake. It will speed up the absorption and be easier on your stomach.
- A drink with about 6-10 percent carbohydrate by weight is considered ideal for quick absorption. Any more can cause gastrointestinal irritation.
- Avoid very cold water during intense exercise, as it can delay absorption and cause gastrointestinal irritation.

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