Getting Ready to Ski at Altitude.

There are two key factors to consider when getting ready to ski at altitude. They are: 1.) Staying hydrated (particularly maintaining blood volume) and 2.) Replacing muscle glycogen stores (main energy source needed for skiing). The Midwest is 800-1,000 ft above sea level whereas Copper, Vail, Winter Park and Aspen are all at least 6-8,000 ft at the base and 10,000+ ft at the top. That much change in altitude will cause one’s body to an adaptive stress mode.

First, it will try and increase red blood cell concentration so oxygen delivery is not compromised. Unfortunately, our body does not just kick out red blood cells as quickly as we need them, so the body improvises by dumping some blood volume (plasma-the water part of blood). This is a natural dehydration process that makes the same number of red blood cells circulate a little more often thereby having a similar effect as having more of them. The down side of this is that it makes the heart work harder. Within several days the body will start to release more red blood cells, but only if blood volume is back to normal levels. And the only way to keep blood volume at normal levels is to stay hydrated. Drink enough to prevent yourself from feeling thirsty and so that you pee normally. A quick check is urine color and odor. It should be light yellow with no strong odor (exceptions-vitamin supplements or specific foods can alter this). Water works ok, but only in small amounts (1-3oz) at a time. We recently demonstrated in our lab in St. Cloud that drinking large quantities of water at one time results in increased urine output with only ~30% retention of fluids. Sports drinks with electrolytes appear to work better, but our work with Alpine racers in Park City suggests, a carbohydrate or carbohydrate-protein combination works best.

The second factor to consider when skiing at altitude is getting enough carbohydrate to your muscle. As the body senses mild decreases in oxygen at altitude, it will use more carbohydrate for energy and the body makes this switch without asking. We found with junior Alpine racers that when they consume a combination of carbohydrate and a little protein (3-5:1 ratio found in items such as Chocolate milk, some energy bars or Accel gels) racers felt better and DNF’d half as often in training as with a placebo. And these are racers used to altitude. Imagine what this might have on folks like us, not used to altitude.

**Here’s how you start:** Before you even go to altitude, you’ll want to become “Euhydrated” which means normally hydrated. A few days or better yet a full week before going to altitude and on the way to altitude, carry a bottle of water and sip on it all day long. Taking in about 3-4 oz per hour is a good amount. It will allow the water you take in to be absorbed. Drinking too much too fast will just result in sending you off to the bathroom every 30 minutes. After a while, you should notice that your urine output is about the same as before, but it will often times be quite clear (that’s a good thing). This should tell you that you are euhydrated.

Keep up the same fluid intake as you travel, but you might switch to carb-electrolyte or carb-protein to make sure your muscle glycogen stores are full which often takes a few days of eating well to achieve.

When you arrive at altitude, avoid drinks with caffeine and/or alcohol. These are diuretics causing your blood volume to drop. Remember, your body will automatically reduce plasma volume and you don’t want to reduce it even more. Within a day or two your plasma volume will return and your red blood cell count may even go up a bit.

Skiing at altitude will take more energy from carbs and therefore it is a great idea to eat something as you head back up the chair. A 60 sec. training or race run can burn anywhere from 40-100 g of carbs. Your body can only store about 300-500g total. That means you have got to replace some of the carbs you use as soon as you can. Here’s where convenience foods are great. Is there anything magical about these convenience foods or gel packs… nope. The carb-protein combination is beginning to show an edge; however, just carbs are better than nothing: granola bars, trail mix, sports drinks, energy bars, (A few years ago, bananas and gummy bears were what the Sports Science Team was using for the US Ski Team), it doesn’t seem to have much difference as long as you’re getting some carbs to replace the ones you’re using.

So, drink a little extra, try a Gel pack or some gummy bears. Just eat some extra carbs and in so doing, you won’t compromise your experiences. The last thing you’d want to do is run out of gas before the end of the training and/or competitive week.

_Halz and Beinbruch!_ (A German/Austrian phase for good luck meaning “break your neck and leg”)

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