

# Athletes Need to Maximize the Recovery of Fuel, Fluids & Damaged Muscle Tissue.... Power Play 2004

Goal	Comments		
Refueling	<p>Re-fueling for multiple training sessions or competitions in the same day, takes a little more diligence than athletes who have a full 20-24 hrs to replenish their fuel stores. Efficiency of re-fueling (recovery) your muscles is improved when approx. 50-80 g of carbohydrate are consumed immediately (minutes) after an intense or long training session, and 50g at 1-hr intervals for 3-6hrs thereafter. Muscles absorb carbohydrates at a much quicker rate immediately after exercise, compared to waiting 1-hr or more, and certain foods can also accomplish this more effectively than others. High Glycemic Index or "Quick" absorbing carbohydrate foods include raisins, fruit leather, high carb energy bars, bagels (with no spread), flavored rice cakes, power gels, &amp; carb load drinks. Have a LARGE serving of one or more of these foods/drinks immediately after your workout, and again every <i>hour</i> for 3-6 hrs, to replenish your muscle's fuel stores. Taking advantage of this "right time" with these "right foods" will ensure that you are energized and ready, for competition or training later that same day, or the next morning. During <i>intense</i> daily training or competition, recovery is also likely to be improved when DAILY carbohydrate intake is increased to 8-10 g per kg body weight each day. ie: Up to 750+ carb grams/day for 180lb athlete (500+g/day for 140lbs). These high intakes will maximize your training by preventing your fuel stores and energy levels from becoming depleted, which can readily occur with the daily demands of high intensity training. Maintaining a high carb diet will also prevent using amino acids (protein) for fuel.</p>		
Rehydration	<p>Most athletes finish training or competition sessions with some level of fluid deficit. In hot conditions or after strenuous sessions, fluid losses are usually large and require a focused effort to rehydrate after the workout. In this case, comparing pre- and post-session measurements of body weight can provide an approximation of the overall fluid deficit. You may need to replace 150 per cent of the fluid deficit to get back to baseline - for example, if you are 3lbs lighter (6 cups) at the end of the session, you will need to drink 9 cups of fluid over the next few hours to fully replace the existing and ongoing fluid losses. Sports drinks will minimize fluid losses (by providing electrolytes) due to frequent urination often experienced with drinking large amounts of plain water. Salty foods w/ water also work to prevent excessive urination and help to retain ingested water.</p>		
Immune System	<p>In general, the immune system is suppressed by intensive training, with many parameters being reduced or disturbed during the hours following a heavy training session. This may place athletes at risk of succumbing to an infectious illness during this time. Many nutrients or dietary factors have been proposed as an aid to the immune system - for example, vitamins C and E, glutamine, zinc and echinacea - but none of these have proved to provide universal protection. Recent research does support the use of extra antioxidants such as Vit C (250-500mg/twice a day) and E (400IU/day) during strenuous training/competition. However, most evidence points to carbohydrate as one of the most promising nutritional immune protectors. Consuming carbohydrate during and/or after a prolonged or high-intensity training session/competition has been shown to reduce the disturbance to immune system markers. Carbohydrate intake may be beneficial for a number of reasons. For example, it reduces the stress hormone (cortisol) response to exercise thus minimizing its effect on the immune system. It also supplies glucose to fuel the activity of many of the immune system white cells.</p>		
Muscle repair and building	<p>Prolonged and high-intensity exercise causes a substantial breakdown of muscle protein. During the recovery phase there is a reduction in catabolic (breakdown) processes and a gradual increase in anabolic (building) processes. Recent research has shown that early intake of essential amino acids from good quality protein foods helps to promote the increase in protein rebuilding. In fact, protein consumed immediately after, (or in the case of power/strength training sessions, immediately before the session 6-10 g ONLY) is taken up more effectively by the muscle into rebuilding processes, than protein consumed in the hours afterwards. However, the protein needs to be consumed with carbohydrate foods to maximize this effect. Carb intake (along with protein) stimulates an insulin response, which can decrease catabolism &amp; quicken repair of damaged muscle tissue. <i>*However, refer to re-fueling above (no protein) if fuel repletion is a priority. Protein intake for muscle repair will then be delayed, to allow maximal FUEL replenishment with muscle repair/recovery (protein intake) to be addressed a few hours later or after last training session when fuel needs are no longer critical*</i></p>		
	<p><b><u>Carbohydrate (CHO) -rich recovery snacks (Purpose is to optimize fuel recovery – aren't always the "healthiest" foods)</u></b> (50g CHO portions)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <ul style="list-style-type: none"> <li>700-800ml sports drink (Gatorade, Powerade etc)</li> <li>2 sports gels or 3-4 fruit leathers or 1 cup raisins</li> <li>500ml fruit juice or fruit drink (pop if that is only option)</li> <li>300ml carbohydrate loader drink</li> <li>60-70g packet jelly beans or ju-jubes or chocolate covered raisins</li> <li>2 slices toast/bread with jam or honey or banana topping</li> <li>1 large chocolate bar (80g) (especially Mars bar)</li> </ul> </td> <td style="width: 50%; border: none;"> <ul style="list-style-type: none"> <li>2 cereal bars (ie Nutrigrain, Gatorade bars)</li> <li>1 cup thick vegetable soup + large bread roll</li> <li>1 large or 2 small low-fat muffins, fruit buns or scones</li> <li>1.25 cups steamed rice</li> <li>1 large baked potato with salsa filling</li> <li>2 med pancakes + 2-3 tablespoons syrup</li> </ul> </td> </tr> </table> <p><b><u>Carbohydrate-Protein recovery snacks (be sure to have a high intake of fruits &amp; veggies at other meals)</u></b> (contains 50-75g CHO + valuable source of protein and micronutrients)</p> <ul style="list-style-type: none"> <li>250-300ml liquid meal supplement</li> <li>250-300ml protein/fruit shake</li> <li>1-2 sports bars (check labels for carbohydrate and protein content)</li> <li>1 large bowl (2 cups) breakfast cereal with low fat milk</li> <li>1 large or 2 small cereal bars + 1-2 cups fruit-flavored yogurt</li> <li>1 cup baked beans on 2 slices of toast or on a baked potato</li> <li>1 bread roll with cheese or peanut butter + large banana</li> <li>2 cups fruit salad with 200g fruit-flavored yogurt</li> <li>Bagel with thick spread peanut butter + 1-2 cups low fat milk</li> <li>300g (large) baked potato + low fat cottage cheese filling + 1-2 cups low fat milk</li> <li>2-3 slices veggie pizza (no meat)</li> </ul>	<ul style="list-style-type: none"> <li>700-800ml sports drink (Gatorade, Powerade etc)</li> <li>2 sports gels or 3-4 fruit leathers or 1 cup raisins</li> <li>500ml fruit juice or fruit drink (pop if that is only option)</li> <li>300ml carbohydrate loader drink</li> <li>60-70g packet jelly beans or ju-jubes or chocolate covered raisins</li> <li>2 slices toast/bread with jam or honey or banana topping</li> <li>1 large chocolate bar (80g) (especially Mars bar)</li> </ul>	<ul style="list-style-type: none"> <li>2 cereal bars (ie Nutrigrain, Gatorade bars)</li> <li>1 cup thick vegetable soup + large bread roll</li> <li>1 large or 2 small low-fat muffins, fruit buns or scones</li> <li>1.25 cups steamed rice</li> <li>1 large baked potato with salsa filling</li> <li>2 med pancakes + 2-3 tablespoons syrup</li> </ul>
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