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## **Nutrition and Supplements for optimizing sports performance**

Nothing can replace good nutrition, hard work, and training for improving your athletic performance. However, there are some nutritional guidelines that may help you get enough energy and protein to help you perform at your best. In addition, there are some supplements and tips which can boost muscle building and exercise tolerance.



**Stay Hydrated!** People can sweat up to 2 L/ hour! Even 2% dehydration can significantly impair exercise performance. Before competition, drink about 500 ml of sports drink the night before, and 500 ml when awake. Then about another 400-600 ml cool water 20-30 min prior to exercise. Athletes may need to drink 12-16 oz (1.5-2 cup) every 5-15 min depending on activity!

**Get enough Carbs!** Athletes doing moderate intense training (2-3 hrs intense exercise a day, 5-6 x a week) require 5-8 g/kg/day. Eat whole grains, vegetables and fruits. Reserve quick absorbing carbs (refined sugars, starches, engineered sports products) for replenishing depleted stores after exercising for more than 1.5-2 hours continuously. For instance, during a 3 hour training session, after 2 hours, take some carbohydrates (Glucose /electrolyte solutions) to help with the rest of the session. Also it takes about 4 hours to absorb carbs, so if competition is in the afternoon, breakfast is key to optimize muscle and liver energy storage. Also 30-60 min prior to competition, a light carbohydrate may help fuel you to the end of the exercise session.

**Protein builds muscle!** Athletes need more protein than normal people, otherwise muscle will breakdown, and your performance will decrease. Moderate intense training requires 1.2-2 g/kg/day of protein. The best quality protein comes from skinless chicken, fish, egg whites, very lean cuts of beef, and skim milk (which contain casein and whey).

**Eat after intense exercise to recover quickly!** Within 30 min, eat a carbohydrate (1g/kg) and protein (0.5g/kg) meal, and a high carb meal at 2 hrs after exercising. This nutritional strategy has been found to restore energy reserves and build muscle and recover faster. Prior to competitions, carb load (add 200-300g more) for 2-3 days to improve exercise endurance.

**Supplements with Strong evidence and Apparently safe:** HMB, Creatine monohydrate, Essential amino acids, protein for muscle building. HMB is a metabolite of the amino acid leucine, and 1.5-3g/day increases muscle mass over 4 weeks with training in beginner athletes. Trained athletes require 12 weeks of supplementation to increase muscle mass. Creatinine monohydrate is currently the most

effective supplement at increasing muscle mass and exercise endurance. The quickest method of increasing muscle creatine stores appears to be to consume ~ 0.3 g/kg/day of creatine monohydrate for 5–7 days followed by 3–5 g/day thereafter to maintain elevated stores. Other performance enhancers include caffeine, B-alanine, carbs, sodium phosphate, sodium bicarbonate, water and sports drinks.

**Stuff that probably doesn't work:** Fenugreek, arginine, carnitine, glutamine, ribose, medium chain triglycerides, boron, chromium, alphaketoglutarate, prohormones, isoflavones.

To prevent soreness, there is some evidence that cold water immersion (10 min) may prevent or treat muscle soreness after exercise.

Source: <https://jissn.biomedcentral.com/articles/10.1186/s12970-018-0242-y#Tab1>  
<https://www.ncbi.nlm.nih.gov/pubmed/22336838>

