



EVIDENCE FOR THE BENEFIT OF DIETARY SUPPLEMENTS FOR TEAM SPORT ATHLETES

Kris Osterberg, PhD, RD, CSSD, Gatorade Team Sports Manager

Kris Osterberg, PhD, RD, CSSD, Gatorade Team Sports Manager shares evidenced-based information on how five dietary supplements can positively impact athlete health and performance.

CAFFEINE

- **Dosage:** ~3 mg/kg body mass 30-70 minutes prior to exercise
 - For example, a 200 lb athlete can have ~279 mg, which is equivalent to 3 eight-ounce cups of coffee.
- **How can this help my athletes?** Caffeine consumption blocks receptors in the central nervous system that, when activated, contribute to decreased locomotor activity, increased pain perception, and reduced arousal. As a result, athletes may see enhanced effects on their vertical jump, any work that involves repeated jumping and sprinting, agility, and sport-specific endurance performance, like running distance during match play
- **What about side effects?** It should be noted that too much caffeine could result in sleep disturbances, jitteriness, irritability and anxiety

NITRATE

- **Dosage:** 300-600 mg.
 - To put this into perspective, some common foods that contain nitrate are arugula (420mg in ~5 cups), spinach (180mg in ~3 cups) and beet root juice (~400mg in 500ml of juice or a single 70ml shot)
 - Doses higher than 900mg are not correlated with any improvements
- **How can this help my athletes?** Increased availability of nitrate can increase blood flow to the muscle and has proven benefits for endurance exercise. Additionally, it's shown to benefit sprinting (180m), cycling, short repeated sprinting, cognitive function and reaction time
- **What about side effects?** No side effects for the recommended doses (300-600mg), but urine may turn red for those who consume beet root or beet root juice

CREATINE

- **Dosage:** Recommended dosages vary:
 - 20g/day (divided into 3-4 doses) for 5-7 days
 - 3-5g/day for 4 weeks
 - 0.03 g/kg/d for 4-6 weeks
- **How can this help my athletes?** Creatine is shown to reduce recovery time between high-intensity efforts, increase the volume of work and provide better training adaptations. It's beneficial in high-intensity efforts that last <30 seconds, which includes strength training, repeated efforts (i.e. jumping, sprinting, weightlifting), and high-intensity efforts at the end of a game. It also has antioxidant properties, reduces muscle damage, improves cognitive function and enhances the rate of glycogen synthesis
- **What about side effects?** Creatine use can lead to water retention and the potential loss of range of motion (ROM) in the early loading phases

B-ALANINE

- **Dosage:** 3.2-6.4g/day over 4-24 weeks
- **How can this help my athletes?** B-alanine regulates excitation-contraction coupling by increasing calcium sensitivity, which is beneficial for high-intensity exercise lasting 2-4 minutes, but there is high variability between individuals. Most data relate to training improvements, like repeated sprint speed, total volume of work or short-duration muscular force (i.e. cycling)
- **What about side effects?** One notable side effect is paresthesia, which is a burning, prickling or tingling sensation of the skin

SODIUM BICARBONATE

- **Dosage:** 0.2-0.3 g/kg with 0.5-2L of water 60-90 minutes prior to exercise. High doses, like 0.4 g/kg, may be better tolerated when spread in 3-4 doses for 3-5 days and taken with a high carb meal or supplement
- **How can this help my athletes?** Sodium bicarbonate acts as an extracellular buffer in maintaining the the body's pH levels to avoid muscle fatigue. It is beneficial in exercises lasting 1-10 minutes and improves repeated high-intensity performance by 2.3%
- **What about side effects?** The buffering effect of sodium bicarbonate can neutralize stomach acid, which causes CO₂, bloating and gas. Other side effects include nausea, vomiting and diarrhea

