Established Performance Supplements (1 of 5)  
(when used according to established protocols)  

**CAFFEINE**

**Mechanisms**
- Adenosine receptor antagonism,
- Increased endorphin release,
- Enhanced neuromuscular function,
- Improved vigilance and alertness,
- Reduced RPE during exercise

**Positive impact on endurance performance**
- Studies reporting benefits typically used caffeine dosages of 3–6 mg/kg of body mass (BM), in the form of anhydrous caffeine (i.e., pill or powder form), consumed ~60 min prior to exercise,
- Positive results also reported with lower caffeine doses (<3 mg/kg BM, ~200 mg), provided both before and during exercise,
- Or 100–200 mg (1.5–2.9 mg/kg BM) of caffeine consumed in combination with a carbohydrate electrolyte solution,
- Larger caffeine doses (≥9 mg/kg BM) do not appear to increase the benefit to performance (nausea, anxiousness, insomnia, and restlessness),
- Can be administered in chewing gum form

**Positive impact on short-term, supramaximal, and repeated sprint tasks**
- ~65% of studies on of ≤5 min efforts resulted in performance benefits,
- Low to moderate doses of caffeine (~3–6 mg/kg BM), consumed 60 min preexercise, appear to have the most consistent positive outcomes on sports performance in research situations, although a variety of other protocols also appear beneficial, and are practiced in real-life,
- Athletes who intend to use caffeine as a performance aid should trial their strategies during training or minor competitions, in order to fine-tune a protocol that achieves benefits with minimal side effects

Reference: by Peeling et al. IJSNEM 2018