USOC SPORTS NUTRITION

CAFFEINE FACTSHEET

THE UNITED STATES OLYMPIC COMMITTEE

Caffeine and the Body

Caffeine is the most widely accepted and commonly consumed drug in the world. Caffeine activates receptors in the brain and body that counteract many of the inhibitory effects fatigue has on mental and physical performance. It is now widely considered an “ergogenic aid”, or something that enhances performance. The NCAA is the only organization that restricts the amount of caffeine in an athlete’s system by limiting urine concentrations to 15 ug/mL, which equates to ~500mg caffeine or ~6 to 8 cups of coffee 2 to 3 hours before an event.

It’s important to understand that every athlete responds differently to varying amounts of caffeine, so dosing for performance should be done gradually and tested in training before use during competitions. Low doses of caffeine (≤3mg/kg of body weight or ~200mg) have been shown to be ergogenic for a number of sports, and also carry less risk of side effects.

Caffeine and Sport Performance

Positive Effects of Caffeine:

- Enhances endurance exercise performance
- Improves reaction time, concentration, and self-perceived energy levels
- Low doses increase energy expenditure and oxygen uptake without changing perceived effort, exercising heart rate, or fuel usage
- Delays feelings of fatigue, and lessens sensations of exertion and pain
- Reduces time to complete a set amount of work

** Positive effects can improve endurance (e.g. triathlon), team (e.g. rugby, soccer), “stop-and-go” (e.g. golf, archery), and short-term, high-intensity sport performance (e.g. rowing, sprinting).*

Possible Side Effects of Caffeine:

- Anxiety / nervousness
- Overstimulation / jitteriness
- Mental confusion
- Elevated resting heart rate
- Restlessness
- Inability to focus
- Gastric irritant
- Mild diuretic
- Insomnia / disrupted sleep
- Addiction (from overuse and reliance)

** Side effects can inhibit performance in technical sports and those with evening competitions if dose or timing is inappropriate.*

Strategies for Using Caffeine

Follow these guildelines to safely incorporate caffeine into training and competition with the help of a sport dietitian. It is not necessary to limit caffeine consumption leading up to a competition in order gain a performance benefit. Remember that caffeine is not a substitute for food, which provides energy from fat, carbohydrate, and protein. Caffeine should never be used as an alternative for insufficient fueling and recovery!

- **Timing**
  - Consume ~1 hour before training or competition.
  - For exercise lasting longer than 2 hours, it may be helpful to "top up" with another low dose of caffeine. Low doses (80-120mg) during prolonged exercise can be beneficial, even without having any before.
- **Amount**
  - Tolerance is highly individualized, but 1-3 mg/kg is usually recommended.
  - For example, recommendations for a 50 kg (110 lb.) female would be between 50mg - 150mg.
- **Type**
  - Test different sources of caffeine in training to determine what is most effective (coffee, pills, gels).
  - **Avoid using energy drinks** as they typically contain high concentrations of caffeine along with other stimulants that could be derivatives of banned substances (e.g. geranium, ma huang).

Caffeine Content of Common Items

Product	Caffeine (mg)
Energy Gels/Gummies	20-150
Caffeinated Soda (e.g. Cola, Diet Cola)	35-115
Caffeine Pills	100-200
Bottled Coffee (Pre-made)	75-200
Migraine Headache Medication	130
Brewed Coffee (8 oz.)	60-150+
Espresso Shot (1 oz.)	60-200+
Black Tea (8 oz.)	42-110+
Green Tea (8 oz.)	15-50+
Milk Chocolate Bar (3.5 oz.)	12

**Many of these items have wide variations in caffeine content due to preparation methods, even in the same restaurant (e.g. coffee, espresso, tea).*

Be aware these ingredients (common in energy drinks) are also a source of caffeine:

Guarana
Yerba Mate / Guayaki
Guayusa
Kola Nut
Cacao

Athlete Recommendations: