Caffeine and Endurance

Intro:
For years athletes have been using caffeine to improve performance for various sports at various doses. Everyone knows that a strong cup of Java gives you that alertness and sense of extra energy. Drink three cups of leaded Starbucks coffee and feel like you want to run a marathon! So, does the caffeine just make you want to run that marathon or…..do you actually run it and run it faster? YES! But only if done correctly. Though many professional endurance athletes use caffeine to enhance their performance, the US Olympic Committee, World Anti-Doping Association and US Anti-doping association all ban substances because of safety and because they could offer an unfair advantage. Caffeine is banned at (12mcg/ml in urine), which requires about 1,200 mg of pure caffeine or 8 cups of strong coffee. The following article will give you some insight on HOW and WHO can benefit from caffeine.

Caffeine stimulates the central nervous system (CNS), increases the release of adrenaline, increases the use of body fat as fuel and spares glycogen. Adrenaline release is accomplished through caffeine’s effect on epinephrine and nor-epinephrine. This CNS excitatory response is used by many athletes to give them that alertness and sense of extra ‘energy’ needed for their workouts. More importantly, caffeine mobilizes free fatty acids in the blood. Increased FFA in the blood allows the body to use fat as a fuel source. The use of fat as fuel allows the body to spare glycogen (carbohydrates) for later use in exercise.

Notes to consider:
- Caffeine is classified as a diuretic. More important than any supplement, an athlete’s water balance determines how efficient he/she will perform. Diuretics not only dehydrate the body, they can cause bowel movements and gastric distress which would obviously be detrimental to your exercise bout.
- Habitual caffeine users will not see any ergogenic effects from caffeine prior to a race. Your body has an intricate natural defense mechanism (builds a tolerance) which over time compensates for high doses of most nutrients and chemicals you put in your body which . In other words, if you use habitually use caffeine you can expect your body to reduce all the beneficial endurance and performance effects.
- Caffeine is also a thermogenic. This means it will raise your heartbeat and core body temperature. As you can guess, this may not be wise when exercising in heat.
- Caffeine has not shown any benefit on power and strength.

The previous four points may make you think that caffeine should not be used by anyone as an ergogenic aid. The majority of the research on sedentary individuals does not support the use of caffeine as an ergogenic aid. However, the research done on trained athletes showed no detrimental diuretic effect and no increased body temperature. Trained athletes who are also habitual caffeine users can get benefit from caffeine if they abstain at least three days prior to the event. Even though caffeine does not increase power, it has been shown to reduce the perceived effort at a given workload. IE cycling
at 24mph may seem easier when loading with caffeine.

Recommendations:  Do not use any caffeine for three days (or more) prior to an event. Start 3 to 4 hours prior to your event and consume 5mg – 10mg of caffeine per kg body weight (that’s 350mg to 700mg for a 150lb male).*  This is a large amount of caffeine, so be sure to experiment before you do this with incremental levels of caffeine.*  Caffeine will only help in long endurance events of 2+ hour duration. If you are not trained, then you are better off not using caffeine at all.

*Excess caffeine can cause anxiety, irritability, delirium and hallucinations. Caffeine increases core body temperature and heart rate. Consult a physician before using caffeine prior to exercise.

Typical Caffeine amounts:
Soda:      50mg caffeine
Cup of Coffee: 50 – 150mg caffeine
Cup of tea:  10 – 50mg caffeine
Guarana:   active ingredient is caffeine (8% to 15%)
Green tea herb: active ingredient is caffeine (0% to 15%)

References:
1: J Appl Physiol 2000 Nov;89(5):1837-44


