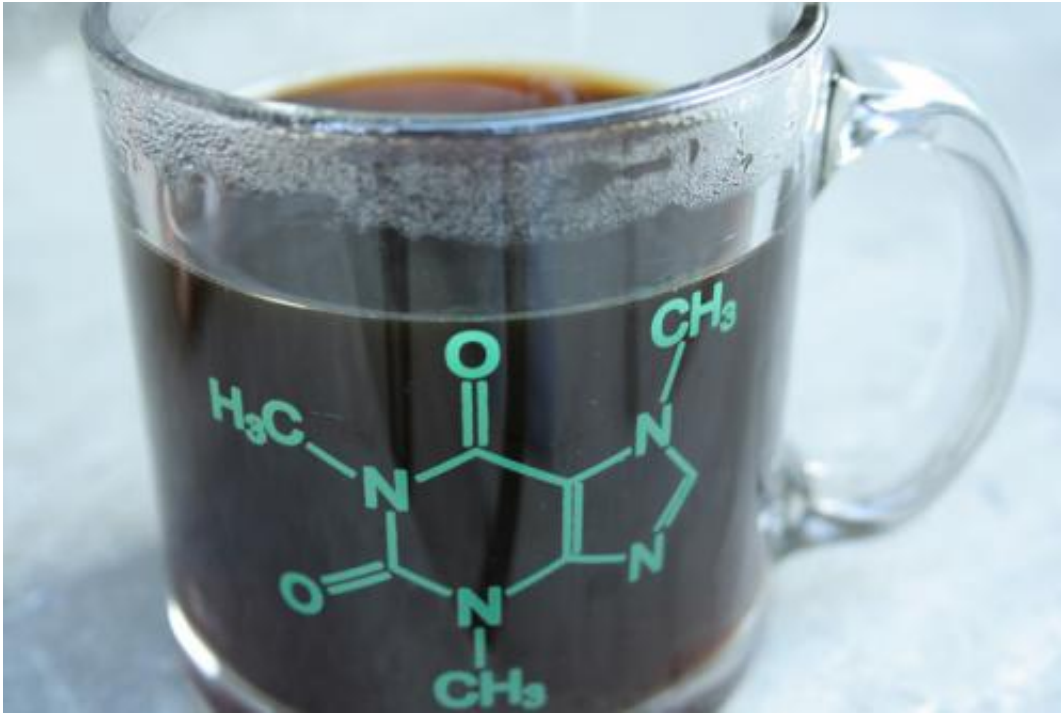


Does caffeine enhance performance?

January 10 2014, by Chris Forbes-Ewan



About 80% of the world's caffeine is consumed in the form of coffee. Credit: jennybach

Unlike many drugs, caffeine may be taken legally by people of all ages, which helps make it the world's most widely used stimulant.

Approximately [80 percent of the world's caffeine](#) is consumed in the form of [coffee](#); it's been estimated that [500 billion cups of coffee](#) are consumed throughout the world every year.

Tea, chocolate, cola drinks, and energy drinks and shots are the other main sources of caffeine.

Impact on physical performance

Caffeine has been used to good effect by athletes as an [aid to physical performance](#) for many years. Initially, it was believed to be of greatest benefit in endurance events (marathon running, for instance, or long-distance swimming).

More recently, we've realised that caffeine also boosts performance for short-term, high-intensity activities, such as middle-distance running, and stop-start sports, such as tennis.

Until a decade or so ago, it was thought that very high doses of caffeine (higher than could be obtained by simply drinking coffee, for example) were needed to enhance athletic performance.

Such high doses could usually only be obtained from caffeine-containing capsules, and often led to adverse side effects.

Consequently, the International Olympic Committee (IOC) banned caffeine use by athletes above a certain level of intake.

But by early this century, it became clear that moderate doses of caffeine—achievable by drinking coffee, [tea](#) or energy drinks—were just as effective as very high doses for enhancing physical performance. And they had minimal risk of side effects.

It was also discovered that [caffeine intake](#) is "self-limiting" to some extent, that is, extremely high doses are likely to have a detrimental effect on [athletic performance](#).

So, in 2004, the IOC ban on caffeine was completely lifted; Olympic athletes may now take as much caffeine as they like.

How much is enough?

What, then, is the most appropriate source of caffeine if you're an athlete who wants to safely obtain a performance benefit?

Well, you could try coffee or tea, but the amount of caffeine in these beverages varies greatly. Energy drinks, on the other hand, are formulated to contain a known quantity of caffeine, so they allow for a more controlled intake.

A dose of about three milligrams of caffeine per kilogram of body weight will give you the desired boost to performance, with little likelihood of inducing the "caffeine shakes" that can result from overdosing.

So, for example, if an energy drink contains 80 milligrams of caffeine, and you weigh 55 kilograms, a couple of cans of energy drink will provide the recommended dose.

Some people believe that caffeine is a diuretic, that it promotes excessive urine production and therefore leads to dehydration. This is not correct, at least when caffeine is consumed in moderate amounts by habitual users.

People who regularly drink tea, coffee, [cola drinks](#), energy drinks or energy shots can expect to receive the desired performance enhancement from caffeine without experiencing greater dehydration.

Making you sharper

There's also evidence that caffeine improves some aspects of [mental performance](#). Doses up to about 200 milligrams (similar to the dose that enhances physical performance) lead to increasingly quicker reactions, increased alertness, elevated mood and improvements in activities such as typing (greater typing speed with fewer mistakes).



The amount of caffeine in tea and coffee varies greatly. Credit: Ryan Hyde

The quantity of caffeine needed to enhance mental performance can be obtained by drinking one or two cups of coffee, one or two cans of energy drink, or several cups of tea. (But note the earlier advice that caffeine concentration is very variable in coffee and tea.)

People who need to maintain vigilance during a period when they would normally be asleep, such as long-distance truck drivers, nightwatchmen, shift workers, students "cramming" for exams and soldiers on sentry duty, often use caffeine from coffee, tea, energy drinks and shots or capsules to keep them awake and alert.

The US Army now uses a commercially available caffeinated chewing gum called "Stay Alert" in one of its combat rations (the First Strike Ration). This ration is issued to soldiers who are expected to take part in operations of up to 72 hours with minimal sleep. Stay Alert gum contains 100 milligrams of caffeine per stick and there are five sticks in the First Strike Ration.

A little doubt

In the interests of objectivity, I should point out that a small minority of researchers believe that caffeine does not truly enhance mental performance. Rather, they claim that taking caffeine will simply overcome the drop in performance that results from [caffeine withdrawal](#) in people who are used to having caffeine in their body.

But looking at data from military studies I'm familiar with, I believe there's little room for doubt that caffeine can greatly enhance at least some aspects of cognitive performance, particularly when people are sleep-deprived.

It's important to keep in mind though that overdosing on [caffeine](#) is potentially dangerous, particularly for those (mostly young) people who consume too many [energy drinks](#) or shots – especially if they combine these with alcohol.

Caffeine undoubtedly enhances many aspects of [physical performance](#), and very likely several aspects of mental performance too. And unlike most performance-enhancing drugs, it's legal, readily available, and comes in forms that are highly acceptable to most people.

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