
Caffeine & Gymnastics Performance

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Not long ago, several coaches asked if having caffeine (by drinking a cup or more of coffee) before training or competition would improve performance. While this question is often asked for athletes involved in endurance events, it was the first time I had heard it posed for anaerobes. Since then, the question has been posed with increasing frequency and seriousness. So here's some information on caffeine and its ergogenic (performance enhancing) properties.

Where We Get Caffeine

Caffeine is one of several methyl-xanthines found in coffee, chocolate, cola, no-doze, empirin, anacin, and tea. Urinary caffeine levels of 12 mcg/ml is considered doping, and is banned by the IOC and USOC. Given the frequency with which caffeine is found in the food supply, some people may reach that 12 mcg/ml level easily. Frequent coffee drinkers, for instance, may reach that level with eight cups of coffee. It's difficult to tell how tea might contribute to urinary caffeine levels, since different teas have different levels of caffeine. You should be advised, however, that some teas may contribute more to caffeine levels than coffee. Many sodas also have caffeine. Two sodas contribute between 1.5 to 3 mcg/ml caffeine to urine. Chocolate is also a caffeine contributor (one chocolate bar provides about the same amount as two sodas).



How Caffeine May Impact Performance

Most of the studies on caffeine have been performed on endurance athletes, and some of these studies indicate that ingesting caffeine before exercise may improve endurance. The improvements seen in endurance are not fully understood. Part of the difficulty in understanding caffeine's effects is that there is a reduced dose response and adaptation to caffeine ingestion. Therefore, subjects accustomed to consuming foods that contain caffeine may experience no effect on performance with an added caffeine dose, while those who are unaccustomed to consuming caffeine may experience an endurance benefit. In this latter group, recent studies on endurance athletes indicate that caffeine consumed at levels below the IOC limit do impart an ergogenic benefit. It appears that the reason for this benefit is that there is an increase in intramuscular triglyceride (fat) usage during the first 30 minutes of exercise. This spares glycogen (stored carbohydrate), which is typically the limiting factor in endurance activities. When glycogen runs out, so does the athlete. The findings on aerobic (endurance) athletes do not translate, however, to what we can expect to see in anaerobic (power) athletes. In fact, studies of

sprinters generally indicate that caffeine ingestion does not impact on performance.

Problems With Caffeine Ingestion

Caffeine is addictive, and is a diuretic. The addictive nature of caffeine is noticed most when a frequent consumer of caffeine stops consuming caffeine-containing foods. This generally results in 24 to 48 hours of "withdrawal" symptoms that include headaches, sweating, increased heart rate, and restlessness. Diuretics, including caffeine, increase the rate of water loss via the urine, and increase the opportunity for dehydration. Given the importance of optimally hydrated muscles for athletic performance (well hydrated muscle is 75% water), and the traditional underhydration of gymnasts, it makes little sense to consciously add a substance to the diet that increases the chance for dehydration.

Summary

There is no evidence that increasing the consumption of caffeine will, in any way, improve gymnastics performance. The diuretic effect of caffeine may, in fact, reduce performance. Nevertheless, occasional consumption of caffeinated foods is not likely to have an impact on performance, either negative or positive. The best rule to follow in this case is moderation. Don't go looking for it, but you don't have to avoid it if you run into it.

Remember that food is energy.

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