

Nutrition and Health Info Sheet: Caffeine

For Health Professionals

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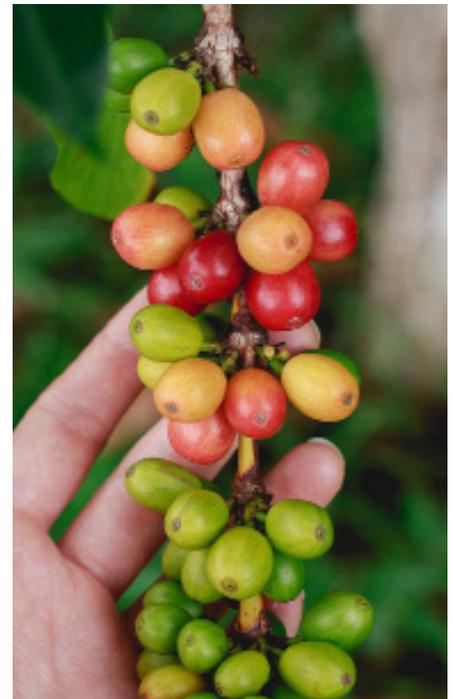
What is caffeine?

Caffeine is a bitter substance found in a variety of food products, including coffee, tea, soft drinks, energy beverages, chocolate, and certain medications.¹ Caffeine is currently the most consumed psychoactive drug;² over 90% of adults in the US consume caffeine daily.³ Caffeine is found naturally in the leaves and seeds of various plants throughout South America and Asia, but it is also a common additive in foods and beverages.^{2,3} Coffee is a common dietary source of caffeine worldwide.³ The caffeine is found in the coffee bean of the Arabica or Robusta plants.⁴

What are common dietary sources of caffeine?

Caffeine is found naturally in coffee beans, tea leaves, kola nuts, and cacao pods.¹ In addition to natural caffeine, there is synthetic caffeine that is used in medications, and some foods and drinks. This includes energy beverages and certain gums and snacks.¹

Much of the caffeine consumed is through drinks. One eight-ounce cup of coffee can contain 95 to 200mg of caffeine.¹



Item	Size (fluid oz, unless noted)	Caffeine content (mg)
Brewed coffee ⁵	8	95-165
Brewed coffee, decaf ⁵	8	2-5
Espresso ⁵	1	47-64
Instant coffee ⁵	8	63
Latte or mocha ⁵	8	63-126
Brewed black tea ⁵	8	25-48
Brewed green tea ⁵	8	25-29
Cola ⁶	12	34
Diet Cola ⁶	12	46

Energy drinks ⁶	16	160-357
Energy shots ⁶	2	200
Coffee-flavored yogurt ⁶	6 (oz by weight)	30
Coffee ice cream ⁶	4 (oz by weight)	11-125
Hot chocolate ⁶	16	25
Milk chocolate bar ⁶	1.6 (oz by weight)	9

How much caffeine is safe to consume?

Over 95% of adults in the United States consume caffeine through foods and/or beverages; 70-90% of this total caffeine consumption comes from coffee and tea. For most population groups, the average daily intake falls below what is considered moderate caffeine intake (a maximum of 400 mg caffeine per day). There are, however, some groups that exceed this upper limit including men aged 31 to 70, and women 31 years and older.⁷ In general, it is not harmful to consume up to 400mg of caffeine per day for adults, though sensitivity to caffeine varies greatly.¹

Because of the systemic effects of caffeine, there are certain groups of people that should limit or completely avoid consumption. These groups include:¹

- pregnant or breastfeeding women
- children
- teenagers
- those with sleep disorders
- those with migraines or other chronic headaches
- those with anxiety
- those with reflux or ulcers
- those with heart irregularities or arrhythmias
- those who have or have had high blood pressure
- those taking certain medications or supplements



What are the effects of caffeine supplementation on health?

Caffeine levels in the blood peak within one hour of caffeine consumption; the effects may persist for up to four to six hours.^{1,3}

Neurological effects: Caffeine stimulates the central nervous system resulting in a feeling of alertness or increased energy.¹ Research suggests that caffeine consumption has positive effects on the brain; one study found that 200mg of caffeine each day may boost long-term memory.³ In rats, caffeine was shown to improve memory retention when administered in moderate doses after a training activity and to improve memory retrieval when provided prior to training.⁸

A study from the Harvard School of Public Health suggests that drinking between two and four cups of coffee each day may decrease suicide risk in adults.³ Some studies show that caffeine may be effective in the treatment of some types of headache.^{2,9}

In children, caffeine consumption may alter food and beverage preferences later in life by affecting the developing brain. Specifically, the reward-and-addiction center of the brain may be affected in a gender-specific manner.¹⁰

Metabolic effects: When consumed, caffeine acts as a stimulant to the central nervous system causing a variety of effects on the body that range from increased alertness and feeling more awake to bouts of agitation and heartburn.¹ Additionally, caffeine can relax smooth muscle, stimulate cardiac muscle, and act as a mild diuretic, increasing urination, in some people.² This diuresis has not been associated with dehydration.¹¹ Caffeine may affect the amount of stomach acid released, potentially causing heartburn, and may also interfere with calcium absorption.¹ Caffeine also increases blood pressure.¹

Effects of caffeine on sleep: In studies of restricted sleep, caffeine-containing gum has been shown to increase response speed, improve detection of events, and maintain overall cognitive function.¹² Caffeine may delay or prevent sleep or improve performance in situations of sleep deprivation; however, these results vary greatly from person to person.³

What are the effects of cutting back on caffeine?

Abruptly eliminating caffeine intake after consumption on a regular basis may lead to caffeine withdrawal; symptoms of withdrawal include headaches, drowsiness, irritability, nausea, depression, anxiety and difficulty concentrating.^{1,3,9} Slowly reducing the amount of caffeine consumed over time can help mitigate these effects. Habitual consumption has also been linked to headaches and migraines.⁹

Does caffeine improve physical performance?

Caffeine is widely accepted as an effective and safe ergogenic aid. Research, though, is conflicting when examining the effects of caffeine on physical performance. Ingestion of caffeine has been shown to markedly improve triathlon performance by reducing swim time and time to completion.¹³ Caffeine has also been shown to reduce perceived measures of fatigue.¹⁴ In runners, coffee ingestion was shown to enhance race performance in comparison to placebo.¹⁵ In experienced basketball players, caffeine consumption was also shown to enhance performance.¹⁶ Caffeine does, however, have its limits in improving athletic performance. One study demonstrated that caffeine did not increase measurements of power through vertical jump or non-treadmill sprinting.¹⁴ Additionally limiting for interpretation is the potential placebo effect of caffeine. One study showed that both the caffeine and the placebo yielded similar performance outcomes and did not alter VO_2 max measurements.¹⁷

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