



## **Caffeine**

### **What is Caffeine?**

Caffeine is perhaps the most socially acceptable and frequently used drug. Yes, caffeine is a drug. More specifically, it's an ergogenic aid, meaning caffeine may help the body perform better during physical activity. Caffeine occurs naturally in some seeds and plants, the most common being coffee and cacao beans. Historically, coffee and tea have been among the most common ways that people have consumed caffeine, but manufacturers have started producing it chemically and adding it to numerous drinks and foods for its physical and psychological boost. Most people are familiar with energy drinks, which may help to reduce fatigue and improve physical performance. Many individuals now also consume caffeine pre-workout, predominantly through energy drinks or gels, to reap the benefits of a more exerting workout.

### **How does it Work?**

Caffeine acts as a stimulant on the nervous system (including the muscles, heart and other organs) by binding to certain receptors and blocking a chemical the body produces more of during stress and trauma. Research seems to consistently support the positive role of caffeine on physical performance, however it doesn't appear to affect everyone the same. Those participating in endurance activities, such as running or playing sports, may see more benefit than those doing resistance activities, such as weight lifting. Individuals who aren't used to consuming caffeine on a regular basis also may see more benefits than those who do.

### **How Much Caffeine is Healthy?**

According to the 2015-2020 *Dietary Guidelines for Americans*, adults who choose to include caffeinated beverages in the form of coffee should not consume more than 400 milligrams of caffeine per day. A shot of espresso has about 75 milligrams of caffeine, whereas energy drinks can range from 47 to 163 milligrams of caffeine per eight fluid ounces.

It is not recommended that people start consuming caffeinated beverages if they are not currently doing so. Used properly and within the recommended amounts, caffeine may have positive outcomes. However, it also is important to make wise choices, as many caffeinated beverage also are sources of calories from added sugars.

## **Coffee**

### **Benefits of Coffee**

If you think your morning cup of coffee provides nothing more to your body than a jolt of caffeine, you might be pleasantly surprised to learn that your daily cup (or three) provides some health benefits as well. Drinking moderate amounts of coffee (including decaf) has been linked to lower risk of cardiovascular disease, Type 2 diabetes, Parkinson's disease and some cancers.

And those antioxidants? Although researchers have yet to determine the exact mechanisms behind some of the disease-preventing effects, it is important to keep in mind that these compounds may be exerting other beneficial effects, such as acting as an anti-inflammatory. Coffee also contains small amounts of some nutrients, including potassium, niacin and magnesium. Making your coffee a vehicle for fat-free milk is one way to ensure your daily calcium and vitamin D needs are met. If your diet does not include dairy, a fortified soy beverage is a calcium-rich alternative.

So how much java is *too* much? It's wise to stick to no more than 3 to 4 cups per day. Certain groups, such as people with hypertension and the elderly, may be more susceptible to the adverse effects of caffeine. Pregnant and breast-feeding women will want to limit intake to a *maximum* of 200 to 300 milligrams a day of caffeine (the amount in 2 to 3 cups of coffee).

## **Tea**

Tea is the most widely consumed beverage in the world next to water. According to the Tea Association of the U.S.A., tea is found in 80 percent of U.S. households. In 2017, it was revealed that black tea accounts for 86 percent

of the tea consumed in the U.S. and green tea for 13 percent while white, oolong, and dark tea make up the remainder.

### **Health Benefits**

Historically, tea has been used in a variety of ways from a medicine, to a tonic, to a social beverage to a food. Research over the past 30 years has validated the health benefits of tea for a variety of conditions. These benefits are derived from antioxidants in tea, primarily flavonoids, as well as caffeine, theobromine (similar to caffeine, and L-Theanine, an amino acid. In addition, chamomile contains terpenoids and flavonoids, also positive for health.

- **Heart Health** – Some of the strongest evidence for tea’s health benefits is heart health. Flavonoids in black and green tea prevent oxidation of LDL (“bad”) cholesterol and reduce blood clotting, both risk factors for heart disease. In addition, strong evidence suggests a link between tea intake and prevention of cardiovascular diseases, especially strokes. Reduced risk for heart problems has also been found in those who drank at least one cup of tea per day.
- **Cancer** – In research on tea and cancer, catechins (a flavonoid) and caffeine have been identified as the cancer-protective substances. Many studies conclude that drinking at least one cup of tea per day (specifically black) is associated with a lower risk of certain types of cancer.
- **Blood Sugar & Diabetes** – Tea, particularly green and oolong (but also black), has been found to reduce blood sugar levels. Chamomile and green teas both inhibit digestive enzymes related to intestinal sugar release, therefore, helping manage absorption of sugar. Strong evidence also suggests a therapeutic potential of green tea (4 cups/day) in reducing risk factors for Type 2 Diabetes.
- **Bone Health** – Tea flavonoids enhance bone formation and inhibit bone loss resulting in greater bone strength. Fluoride and water in tea also strengthens bones. Evidence from research verified that 4 or more cups of tea per day significantly increases mineral content of bones. Black tea has been found to protect against hip fractures in both men and women.
- **Neurological Conditions** – Tea has immediate benefits in reducing tiredness, increasing alertness, and improving mood and memory. Consuming tea, particularly green and oolong, throughout the day could also be appropriate for people with depression and dementia, in addition to medication and/or counseling. Strong evidence has suggested that drinking tea has a strong association with a decreased risk of depression and cognitive impairment.

### **Side Effects of Tea**

There are few side effects from drinking tea. The most common are due to caffeine: upset stomach, anxiety and headache. In general, caffeine content of tea is a third to half that found in coffee. Green tea has 30-50mg per 8 oz., black tea has 25-110mg per 8 oz. and coffee has 100-200mg per 8 oz. serving. There are few adverse effects from caffeine when consumed in moderation (<400 mg day or about 8 cups of tea).

At very high levels (more than 8 cups/day), flavonoids in tea may interfere with iron absorption from plant foods. Drinking tea between meals, instead of with meals, will prevent interference with absorption. Overall, tea is safe for most adults when consumed in moderation and has many potential health benefits at an intake between 3-8 cups per day.

### **References:**

- Cochran, Neva. Bigelow Tea. (2018). *Tea and Health White Paper*.
- Klemm, Sarah. Academy of Nutrition and Dietetics. (2018). *Caffeine and Exercise*. Retrieved from <https://www.eatright.org/fitness/sports-and-performance/fueling-your-workout/caffeine-and-exercise>
- Wolframm, Taylor. Academy of Nutrition and Dietetics. (2018). *Benefits of Coffee*. Retrieved from <https://www.eatright.org/health/wellness/preventing-illness/benefits-of-coffee>