

How Does Coffee Affect Your Metabolism?

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✓ Fact Checked

April 22, 2022

STORY AT-A-GLANCE

- › There's an, often unspoken, effect of coffee drinking that many would consider a benefit – it makes you poop
- › Colon activity increases quickly after a cup of coffee – within four minutes – and the effect persists for at least 30 minutes
- › In terms of acting as a colonic stimulant, drinking caffeinated coffee has effects similar to that of eating a meal, and leads to activity that is 60% stronger than drinking water and 23% stronger than drinking decaffeinated coffee
- › Molecules including exorphins, which are opioid-like compounds in coffee, motilin or the hormone gastrin may be involved in coffee's metabolic effects, possibly due to neurohumoral responses, meaning they involve both neural and hormonal mechanisms
- › By potentially increasing metabolic rate and enhancing the function of brown fat, it's possible that coffee could also contribute to weight loss

Coffee is enjoyed by 7 in 10 Americans each week, while 62% enjoy coffee daily.¹ On the record, the most common reasons why people drink coffee are for the taste and the caffeine boost it provides – to increase energy and “wake me up.”^{2,3} But there's another, often unspoken, effect of coffee drinking that many would consider a benefit – it makes you poop.

In a study published in *Gut*, 29% of volunteers said that coffee “induced a desire to defecate,” and the researchers revealed a distinct effect on distal colon function,

particularly stimulating a motor response, after black, unsweetened coffee (either caffeinated or decaffeinated) was consumed.⁴ Not only did colon activity increase quickly after a cup of joe – within four minutes – but it also persisted for at least 30 minutes.⁵

The Gut study was published in 1990, and the details concerning how coffee affects your metabolism haven't received much fanfare since, possibly because there hasn't been much of a medical reason to do so.⁶ In other words, it's generally understood that coffee promotes bowel movements, but the research that has been done shows that the effects have real physiological underpinnings.

Coffee Causes Your Colon to Contract

In 1998, researchers with the University of Iowa College of Medicine investigated whether coffee might act as a stimulant to the colon.⁷ Using six-sensor probes to test the colons of 12 healthy people, colonic motor activity was tracked while the subjects drank black Colombian coffee, decaffeinated coffee or water, or ate a meal.

Compared with water, both caffeinated and decaffeinated coffee led to a greater number of contractions in the colon, but caffeinated coffee came out on top in terms of stimulating colonic activity. In terms of acting as a colonic stimulant, drinking caffeinated coffee has effects similar to that of eating a meal, but leads to activity that is 60% stronger than drinking water and 23% stronger than drinking decaffeinated coffee.

Beneficial compounds known as melanoidins, which are formed when coffee is processed and cause roasted coffee to be brown, may also play a role in coffee's metabolic effects. While melanoidins play a role in coffee's antioxidant capacity, they function as dietary fiber, being indigestible in the gut.

As such, they're fermented in the gut once consumed, and it's estimated that they could account for up to 20% of the recommended daily intake of dietary fiber in adults, making them significant contributors to colonic health.⁸

Speaking with CNN, Dr. Kyle Staller, director of the Gastrointestinal Motility Laboratory at Massachusetts General Hospital, further explained coffee's effects on the colon as a "gastrocolic mechanism," suggesting that when coffee touches the stomach lining it "triggers either a nervous system or hormonal response that causes the colon to start contracting. Colon contractions move stool in the colon toward the rectum and voila – you have the urge to have a bowel movement."⁹

Coffee May Induce a Neurohumoral Response

Roasted coffee contains thousands of bioactive compounds,¹⁰ some of which likely affect metabolism via neurohumoral responses, meaning they involve both neural and hormonal mechanisms. Molecules including exorphins, which are opioid-like compounds in coffee, motilin or the hormone gastrin may be involved.¹¹

Gastrin stimulates the production of stomach acid (gastric acid), which drives digestion and could boost activity in the colon.¹² In a study involving 10 adults who drank a coffee solution meant to simulate one cup of home-made regular coffee, gastrin levels quickly peaked – 10 minutes after ingestion. Even consumption of decaffeinated coffee led to increases in gastrin.¹³

"Neither distension, osmolarity, calcium, nor amino acid content of the coffee solution can account for this property, which should be ascribed to some other unidentified ingredient," the researchers noted, highlighting that the mechanisms behind coffee's gastrin-releasing properties is unknown.

As for other ways that coffee affects the gastrointestinal tract, coffee consumption has been shown to alter gut microbiota with as few as three cups a day. Lower amounts of potentially pathogenic *E. coli* and *Clostridium* and *Bacteroides* were reported with coffee consumption, while beneficial *Lactobacillus* and *Bifidobacterium* were upregulated.¹⁴

Caffeine in Coffee Stimulates Brown Fat

Caffeine in coffee may be responsible for some of coffee's beneficial metabolic effects, including in relation to brown fat, a beneficial form of fat that may generate heat and burn glucose and fats through a mitochondrial reaction mediated by mitochondrial uncoupling protein 1 (UCP1).¹⁵

Treatment of cell cultures with caffeine has been found to increase the expression of UCP1, and when researchers compared thermal imaging done 30 minutes after healthy human volunteers drank caffeinated coffee or water, increased temperature of brown fat was found in the subclavicular area.¹⁶ By potentially increasing metabolic rate and enhancing the function of brown fat, it's possible that coffee could contribute to weight loss. The researchers explained:¹⁷

"In conclusion, these results provide new complementary in vitro and in vivo evidence that caffeine (and a coffee beverage) can promote BAT function at doses compatible with human use."

That being said, it's not only the caffeine in coffee that affects metabolism; it's likely that many factors are involved. For instance, in a study published in the Journal of Internal Medicine,¹⁸ scientists discovered coffee changed significantly more metabolites in the body than had been known. After eating or drinking, your body produces metabolites, or chemicals. A higher number of affected metabolites may explain, in part, the number of effects coffee has on the body.

The study found that levels of 115 metabolites were altered by drinking coffee, 82 of which were known to affect 33 biological pathways. They also discovered three novel links to coffee including steroid metabolites, fatty acid metabolism and the effect it had on the endocannabinoid system.

Referencing the original Gut study that found coffee promotes motor activity in the colon, researchers from Spain also highlighted that compounds in coffee other than caffeine are likely responsible for some of its metabolic effects:¹⁹

"Since (unsweetened) coffee contains no calories, and its effects on the gastrointestinal tract cannot be justified by its volume load, acidity, or

osmolality, it was soon recognized that it must have pharmacological effects.

Thus, these findings were interpreted as mediated indirectly by a component of coffee other than caffeine, which, by acting on epithelial receptors in the stomach or small bowel, would trigger a gastrocolonic response, speculated at that time to be due to the release of cholecystikin or another hormone.”

The Health Benefits of Coffee Are Well Established

There is growing consensus that coffee – in organic, unsweetened form – offers multiple health-promoting properties. In 2019, the Institute for Scientific Information on Coffee (ISIC) released a report written by Elizabeth Rothenberg, Ph.D., which identified coffee as a potential dietary intervention that could reduce the risk of developing neurodegenerative conditions or relieve some symptoms.²⁰

Researchers have found that caffeine and coffee drinking may provide a protective effect on the neurological system.²¹ The authors of several studies have found that drinking coffee lowers your risk for Alzheimer’s disease²² and reduces overall cognitive decline.²³ There are also indications that the caffeine in coffee might increase insulin sensitivity, as well.²⁴

Further, coffee consumption has been linked to decreased mortality from a number of diseases, including heart disease, neurological diseases, Type 2 diabetes and several types of cancer, including endometrial and liver.²⁵

In one review of 112 meta-analyses about coffee, this popular beverage was linked to a probable decreased risk of colorectal, colon, endometrial and prostate cancers, cardiovascular disease and mortality and Parkinson’s disease, with researchers noting, “Given the spectrum of conditions studied and the robustness of many of the results, these findings indicate that coffee can be part of a healthful diet.”²⁶

A 10-year study presented at the European Society of Cardiology Congress in Barcelona even showed that people who drank four cups of coffee per day had a 64% decrease in their risk of dying from any cause.²⁷ Perhaps it’s not surprising that coffee has such

health-promoting potential, considering that many of the bioactive compounds in roasted coffee have antioxidant, anti-inflammatory, antifibrotic and antiproliferative effects

It's a myth, by the way, that coffee dehydrates you. Drinking even a moderate amount of coffee each day will not lead to dehydration; in fact, habitual male drinkers may enjoy the same hydration from coffee as they do from water.²⁸ This isn't to say that pure water isn't necessary – it's still the preferred form of hydration for your body.

What's the Best Type of Coffee to Consume?

Given all the evidence that coffee stimulates metabolism and the colon, should you reach for a cup if you're feeling "backed up"? It's quite possible that it could help, but you should also address the underlying factors leading to the constipation, such as diet. To prevent constipation, make sure you're drinking enough water each day, and increase your fiber intake to 25 to 50 grams per 1,000 calories consumed.

In other words, if you're not a coffee drinker, there's no reason to feel compelled to start, as there are many other foods you can consume to maintain and improve your metabolic health. For instance, four foods shown to have a beneficial impact on chronic constipation are fermented vegetables, artichoke, kiwi and kefir.

However, if you enjoy coffee, there's good reason to savor a cup – or a few – each day, though there are some caveats to consider. Coffee, which is a heavily pesticide-sprayed crop, should always be organic or biodynamically grown, as well as shade-grown. Coffee is a shade-loving plant, but growers often strip forests to make growing and harvesting easier.

This destroys the ecological habitat of many natural pest deterrents, such as birds and lizards, while the pests flourish, resulting in additional pesticide use in non-shade-grown varieties.

Also, drink your coffee black, skipping the added sugar and milk or cream, as the antioxidant capacity of coffee may be significantly decreased by the addition of milk.²⁹ If

you want to add something to your coffee, try coconut oil or medium-chain triglyceride (MCT) oil, which may help you burn fat and improve mitochondrial function. In addition, consider choosing whole beans and grinding the coffee yourself to ensure it's fresh, not rancid.

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