Coffee – Ergonomic Aid or Unhealthy Beverage?

As the world's most widely used drug, coffee's history is an integral part of human history. Kings have banned it, a Pope made it holy, and wars were both fought over and fueled by coffee.

Every culture enjoys a cup, and cities like New York seem to run on coffee. The most popular beverage in the world is a powerful antioxidant, stimulant, performance enhancer, pain reliever, and mood enhancer. But it can also cause insomnia, anxiety, headaches, and stomach upsets.

Coffee is both loved and hated, but is it good or bad for us? From a holistic point of view, should we drink coffee for its physical and mental benefits, despite the downsides? Do the advantages outweigh the disadvantages?

But first, a quick story to illustrate coffee's profound effects. Not too long ago I work from a restless sleep and started my day with a 1/2 cup of my usual cup of Joe before heading out for my morning exercise. When I reached the gym I grabbed an espresso from the gym cafe. What happened next was something I'd never experienced before.

After working out with my training buddies for an hour (cleans, deadlifts, and rope climbs), I spent another hour pulling and pushing a heavy sled. An hour later, not feeling like I was ready to quit, I joined a tough CrossFit workout. Think 99 squats, followed by 88 deadlifts, *77* push-presses, and you get the idea. I felt like I had a never-ending supply of energy.

After three solid hours of intense exercise, I stared into the fridge in my apartment wondering why I had lost my appetite. A few hours later I left the house to run an errand and felt my heart skipping beats or pumping very hard while I walked. This was a scary moment. The next day I had to drag myself out of bed.

Not everyone will experience the same effects as I did. Coffee's potency depends on the individual. I have friends that can knock back an espresso before resting their heads on the pillow and falling into a deep slumber. Some kind of chemical reaction caused by caffeine on a tired body produced an abundance of energy. If only I knew the secret.

Interesting facts about caffeine

- Coffee is toxic for many animals and insect species
- The coffee bean was discovered almost 1200 years ago
- Most coffee comes from Brazil
- It is one of the most traded commodities on earth
- If you want to reduce the effects of caffeine in coffee, add milk
- But if you're worried about how coffee affects your teeth drink it without milk.

Health Benefits of Coffee for Athletes

Coffee for mental clarity

Mental clarity is important for fitness training of any type. Even if you're hitting the gym just a few days a week or even training for a marathon, the right mindset is important in seeing your goals through. And this often depends on your mood. **Coffee is a mood improver** and has been known to lift the spirits of depressed people. A study published by the Australian and New Zealand Journal of Psychiatry found that coffee consumption significantly decreased the risk of depression in individuals.

Skipping your workout because you "just don't feel like it" can sometimes be a symptom of a temporary depressed state of mind. Have

you ever noticed that some people are constantly upbeat and full of energy? People like that rarely have problems achieving their fitness goals.

I'm not saying that drinking coffee will turn you into Mr. or Mrs. Positive, but it can alter the way you perceive challenges and uncomfortable situations (like that heavy squat day).

Coffee's effect on performance in primarily anaerobic sports

Many studies have tried to determine if coffee helps with strength training. Conflicting advice can be found everywhere but a few studies have found compelling reasons to use coffee as a training aid.

The Effect of Coffee and Caffeine Ingestion on Resistance Exercise Performance was reported in the Journal of Strength and Conditioning research. The results show that coffee, caffeine, and even decaffeinated coffee can help with strength training gains.

On the other hand, a study by the Brazilian Journal of Pharmaceutical Sciences found that caffeine has no positive effects on sports or events that rely on what's called the **glycolytic system**. The glycolytic energy system supplies most of the ATP (Adenosine triphosphate - transporter of chemical energy) to the body during short intense exercise. Think 100m sprint, rugby, wrestling, and gymnastics. The study also found that responses to caffeine are highly individualistic. You've no doubt noticed that some people can drink several cups of coffee and experience no (visible) effects. Others can literally smell coffee and get jittery.

Another study from 2010 found strong evidence to suggest that ingesting caffeine can have a positive effect on maximum strength. However, the positive findings were limited to leg strength. Improvements in upper body strength or strength in other parts of the body were not detected.

The effects of caffeine on performance in young female athletes with training experience in this study from 2017 showed that caffeine improved both strength and endurance in these athletes.

Studies on highly-trained elite athletes performing leg strength tests showed that caffeine can positively affect certain strength aspects. The report highlights that the effects are limited to elite athletes.

Conclusion

The effects of 6mg/kg of caffeine can help athletes involved in sports that use the knee extensors are prime movers. Cyclists will benefit most from this effect as the increased power from higher muscle contractions improves cycling performance.

The effects of caffeine on the central nervous system seems to be a perk of training at a high level or a consistent level. The sedentary worker who hits the gym for a bit of cardio and lights weights a few times a week won't get the same boost from coffee.

Coffee for enhanced endurance training and competition

Although the measured effects are not spectacular, coffee does have a positive effect on athletic performance in endurance events. Again, many of the studies have found the effect most pronounced in cyclists. The sustained power output from the legs of cyclists seems to improve with the ingestion of coffee before a training session or race.

When to take coffee?

The research suggests 3-4 hours before training, especially if you want to encourage fat mobilisation.

One caveat: The research on this topic is not recent and as we know, opinions and facts change. What's accepted as scientific fact one

day might change the next. But for now, we can assume that coffee does in fact improve fat mobilization in the body.

Coffee's positive effect on pain perception in athletes

A study (previously mentioned) by the Brazilian Journal of Pharmaceutical Science also found that coffee found that caffeine in moderate amounts reduced pain perception in teenage, female, karate athletes. Performance was unaffected.

Other studies have confirmed that coffee is, in fact, a pain reliever. How does it work?

Coffee reduces the perception of effort during intense exercise and blocks pathways in the central nervous system (CNS) which tell the brain when you should be feeling pain. As a result, the body's natural pain fighting mechanisms take over and you can train harder and longer.

Another study which looked at pain perception in non-elite athletes during an intense grip-based strength test found that coffee has a positive effect. The coffee-d up athletes felt a reduction in pain despite the time-to-exhaustion remaining the same between control groups in the tests.

Fat burner

A little know fact about coffee is that it can help boost your metabolic rate. A study published in the Critical Reviews in Food Science and Nutrition journal found that fat oxidation increased with coffee consumption. However, this increase was only observed in non-obese individuals. Metabolic rate increases thanks to coffee in all

humans but increased fat oxidation is limited to normal-weight individuals. The findings in this study show that using coffee to lose weight won't work if you're already overweight. However, athletes and healthy-weight people can use it to boost their fat burning levels.

Coffee's fat mobilisation properties are important for athletes training for endurance events. Fat mobilisation refers to the body's ability to turn fat stores into energy. This is the holy grail of endurance sports. The liver can only hold so much glycogen and competitors in long distance events often talk about hitting the wall when these stores run out. Changing from 'carbohydrate' stores to fat stores are primary fuel is the ideal scenario. This also prevents muscle loss from the body cannibalising muscle to use as fuel. Coffee's ability to make the body use fat instead of carbohydrate as fuel has caught the attention of the ketogenic-type diets community

But don't go drinking liters of coffee in the hope of burning more calories. The effect is mild. Caffeine could potentially burn up to 4% more fat but the effects of multiple cups of coffee could wreak havoc with your energy, sleep, and training patterns.

Coffee Myths

Myth #1 - Coffee dehydrates you.

Coffee is almost entirely composed of water. The idea that drinking a cup of coffee will remove more water than you're putting in is not valid. Coffee is a diuretic but the amount of fluid flushed by drinking the beverage is minimal.

Then again, coffee's mild diuretic effect can actually be a good thing. Swelling caused by fluid retention (edema), which is linked to the lymphatic system, can be reduced by taking caffeine in any form.

Health agencies have warned people with swollen legs and feet against drinking beverages containing coffee. The sodium contained in these drinks contributes to the fluid retention. Caffeine is not the culprit so the advice is often misleading.

Myth # 2 - Coffee will make you short in stature and give you weak bones

This is a worrying nugget of misinformation that floats around the Internet. Coffee does in fact, inhibit calcium absorption but the effect is very mild. Most people drink their coffee with some milk and this added milk more than compensates for the effects of the coffee on your bone health.

Don't worry too much about coffee and concentrate more on putting quality foods you put in your body.

Myth #3 - Coffee is addictive.

This came as a surprise to us. But the research hints that coffee is not, in fact, considered an addictive substance.

If you've ever stopped drinking your regular cup of Joe for a day or two you'll know what the 'withdrawal' symptoms feel like. People refer to it as cold turkey but the effects are nothing like those experienced when withdrawing from hard drugs

Caffeine, Caffeine Everywhere

A cup of coffee contains anywhere between 80 and 130mg of caffeine. The brewing methods, roast, types of coffee beans, and brand of coffee all affect the level of caffeine. If you're trying to measure your caffeine intake it's easier done when consuming only pills or formulas. But where's the enjoyment in that? Drinking coffee is one of the great pleasures of life but remember to monitor your own response to caffeine. Regardless of what you read, you will know best how much coffee is enough.

If you're trying to limit your caffeine intake, then be careful with the following products:

- Energy drinks - Most contain caffeine in some form of another. Sugar too. Use in moderation if you're concerned about your waistline
- Pre Workout Supplements - Some contain huge amounts of caffeine, enough to keep an elephant awake for a week. Check the label and adjust accordingly
- Chocolate bars - 100mg of cocoa solids contains 230mg of caffeine. That's the equivalent of 3 cups of coffee. Obviously cocoa isn't the on;y ingredient in chocolate but some chocolate bars, such as the 70% dark chocolate bars so popular today, can contain caffeine levels similar to two cups of coffee, in every 100g of bar
- Ice Cream - Yep, Ice cream can contain caffeine if it contains chocolate or coffee based ingredients
- Weight loss pills - Caffeine's reputation as a fat burner has made an entire industry built on weight-loss pills. The problem is that these pulls contain frighteningly large amounts of caffeine. You'll lose weight for sure if you never sleep and never sit still
- Tea - Black Tea and Green tea, contrary to what many people believe, contain caffeine. A cup of black tea can

contain half of the caffeine of a cup of coffee

- Headache and pain relief medication - As we've seen earlier, caffeine has a positive effect on perceived pain. This has made it a popular ingredient in pain relief pills. If you feel the need to pop a migraine pill, remember that you might be taking the equivalent of an espresso for every pill
- Breakfast cereals - Some cereals pack in a lot of caffeine. Watch out for products with chocolate or cocoa, such as Quaker Cocoa Blasts which contain 11mg of caffeine per 200 calorie serving.

Finally, decaffeinated coffee can often contain significant amounts of caffeine so if you're measuring right down to the last milligram, it might be worth skipping the decaf.

The US food and drug administration agency FDA does not require food producers to list the caffeine content of their products. Essentially the FDA requires that only 'nutrient' values are listed on food labels. As Caffeine is not a nutrient, but rather a naturally occurring substance in many foods, there is no legal requirement to evaluate and inform the public. However, if caffeine is added to a food or food product then it must be included.

The Downside of Drinking Coffee

Despite its favorable qualities caffeine gets quite a bit of negative press. Our favorite brew's effects on the human body are still being discovered but here are a few things to keep in mind if you're using coffee to improve athletic performance. And remember the golden rule, too much of a good thing can be a bad thing.

- Coffee can raise blood pressure. It's still not clear what exactly causes a surge in pressure but scientists know that it happens with some people after drinking a cup of the hot stuff. If you are at risk of suffering from high blood

pressure, it would be wise to avoid coffee, especially before exercise. A study from 2017 found that a caffeine dose of 3.3 mg/kg before intense exercise significantly increases the amount of time it takes for blood pressure to recover to normal levels

- Caffeine can affect sleep patterns. Every year the evidence mounts to prove that proper sleep is one of the most important (if not *The* most important) factors for optimum health. Apart from the fact that we are less motivated and able to exercise and work when we are sleep deprived, the long-term negative health effects are staggering. High blood pressure, stress, diabetes, stroke. The list goes on
- Coffee can stimulate the mind and body to such an extent that sleep is severely hampered and even impossible (until the effect wears off). If you use enough coffee to cause sleep deprivation then you're setting yourself up for health-related issues, both in the short-term and long-term
- Although coffee can promote improved mood in people that consume 1-2 cups per day, it can also cause anxiety in others. Excessive coffee drinking, outside of your normal daily consumption, can cause anxiety and even panic attacks

Conclusion

The response to coffee in the body depends on the individual. Coffees effects on neurotransmitters are handled differently and can vary wildly from person to person. If you're serious about using caffeine and coffee, in particular, to boost performance and improve health you should use a systematic approach to testing. Try different quantities of coffee and measure the results.

If you're thinking of quitting then take the same approach. After quitting, do you notice any positive or negative effects? Can you measure the difference? Coffee is a complex substance and we don't

know the true extent of its potential. Test and test again before deciding how to drink this powerful, delicious beverage.

If you want to use coffee as an energy and antioxidant boost then stick with one cup per day. Some people can tolerate more so experiment to find your tolerance level. **The effectiveness of coffee's benefits decreases the more you consume**. Consistency is the key with coffee. Try to maintain the level of coffee you drink per day. If you enjoy one up, drinking 3 or 4 on certain days a week, followed by abstinence, for example, will have negative effects.

Enjoy your brew but don't overdo it.