

# Health essays - caffeine health effects



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## **Caffeine Health Effects**

### **Abstract**

Caffeine is the most commonly consumed 'drug' in the world that is said to have been discovered in the Paleolithic Period. It is found in basically everything that people consume including all types of food, soft drinks, energy drinks, coffee, tea, and chocolate. The purpose of caffeine is to help strengthen attentiveness and diminish exhaustion. Taking too much or abusing the use of caffeine, can cause side effects, but can all be avoided if taken in reasonable amounts.

So many beneficial effects come with consuming this drug from helping people in sports, to losing weight, to increasing alertness, and repelling things such as snails and slugs. Testing is done often to find more ways that caffeine is useful in individual's lives. In the author's opinion it is believed that caffeine has many more positive effects that overcome the negative effects.

### **Introduction and History**

Caffeine has been around for many years and is having an impact on more and more people everyday. A great deal of evidence denotes that the consumption of caffeine goes all the way back to the Paleolithic Period (Magkos & Kavouras, 2005). Some may think that caffeine is bad for the body and does no good, however many Americans consume caffeine everyday in their diet.

Although caffeine has both positive and negative effects, there are much more positive effects if taken responsibly. Caffeine is a drug that stimulates

the central nervous system, which causes high alertness. Taking too much of any drug is going to lead to the chances of having side effects.

The side effects can be prevented by decreasing the amount of caffeine that is taken into the body. Thus, from increasing alertness, mood, psychomotor performance, to helping as a dietary aid and extending exercise in people suffering from heart failure, to being used as a repellent for mollusks, caffeine is used in many ways and has many positive effects that go along with it. People need to have a better understanding of caffeine before making judgments.

### **Consumption**

The main source of caffeine consumption comes from soft drinks. Caffeine is an additive used in such drinks to sweeten the taste. It can show no flavor depending on the amount taken, but the positive effects that come with it are an increased attention rate and better mood. Because of these effects, more people thrive off caffeinated drinks. Looking around, there are soft drink machines everywhere giving more people access to this stimulant.

Yet, many people believe that they should not be in schools or places where it is efficient for kids because they say it is so unhealthy for them (Keast & Riddell, 2006). Others will argue this in saying that caffeine is good for the body as long as it's not abused. This is a true statement, and as a result educating more people on the effects of caffeine would be very helpful to everyone.

Besides soda and other soft drinks, caffeine is also found in coffee. Coffee has many positive effects to it, such that coffee stimulates the brain and

increases energy and mood, and can help in preventing diseases such as skin, liver, and colon cancer, and some others. Both the combination of daily exercise and a cup of coffee are said by scientists to help in the prevention of skin cancer.

This has been tested and proven on hairless mice, which have extremely sensitive skin to the sun. Stated from *The Times of India*, one group was given caffeinated water to drink, another group exercised on a running wheel at its own convenience, while the third group both drank caffeine and exercised on the wheel, and the control group neither drank nor exercised. All of the mice were exposed to ultraviolet radiation, which the results in comparing all the groups to the control group showed that the caffeine drinkers showed an increase of 95% in ultraviolet radiation stimulating apoptosis.

Apoptosis is the process where cells with damaged DNA are destroyed against illness. The second group showed a 120% increase, while the mice that both consumed caffeine and exercised showed close to a 400% increase (“Coffee May Prevent,” 2007).

A study was also developed to research the effects of caffeine on liver cancer. More than 90,000 Japanese were used in a study and it was found that people that drank coffee daily or close to every day had reduced the risk of liver cancer by nearly half compared to those who never drank coffee. “The American Cancer Society estimates that 18,920 cases of liver cancer were diagnosed in the United States last year and some 14,270 people died

of the illness" ("Coffee May Help," 2008). As a result, it is well stated that caffeine can reduce the chances of liver cancer.

According to many scientists, there is a highly antioxidant compound that is found in coffee that reduces the chances of colon cancer, which is the second leading cause of cancer death in the United States. This compound found in coffee is called methylpyridinium, however is not found in raw coffee beans but is created during the roasting process.

Tests were brought out to scrutinize this compound even more, so specially equipped extracts of the coffee were exposed to certain lab situations of human intestinal cells for three days and were compared to cells that were not exposed to coffee. In the experiment, coffee extracts were found to have increased the activity levels of phase II enzymes. Then, to determine whether it had the same effect in living systems, a group of twenty-four rats was evenly divided into three groups.

Each group was fed different diets, either a normal diet, a diet mixed with coffee extract, or a normal diet containing pure methylpyridinium. The tests showed that rats that were fed the coffee extract had a 24-40% increase in phase II enzymes and the group with the pure methylpyridinium showed an increase in the enzyme activity levels ("Highly Active," 2003). Results show that coffee is proven to fight cancer in living systems.

Caffeine can help in such diseases as cancer in which caffeine and another substance called theophylline are found in many products like coffee, chocolate, and many soft drinks. It is said that they can block enzymes that are crucial for cell growth, which means that one day it could be used to stop

cell growth all together and avoid blood clots that can cause heart attacks and strokes (“ Caffeine Boost,” 2002).

It is not just coffee that prevents cancer, it is the caffeine in coffee that is preventing this disease. As most know, there is no cure for cancer, although the tests above show the many ways in which caffeine can help prevent one of the leading causes of deaths.

Despite the positive effects of consuming coffee, here in the United States, drinking coffee is consumed most by adults. However, in Guatemala, it is very common among children. It is one of the first liquids given to babies after milk in Guatemala, even though it may affect the cognitive function by damaging iron levels. It is also known to hinder with the iron absorption and iron status of pregnant women and their babies, which is why it is said that pregnant woman should give up coffee during the term of pregnancy because it could cause miscarriages (Engle & Vasdias et al, 1999).

Nonetheless, not consuming coffee while pregnant and not giving coffee to such young children can avoid these negative effects.

### **Sports and Diet**

Caffeine is known as one of the most widely used pick-me-ups in sports because of it's ability to increase alertness and mood. Many athletes depend on this stimulant to help them carry on with their game if they are feeling a little drowsy or incapable to perform in an expected manner.

Using caffeine is often used to improve physical and mental performance. It improves physical performance by causing alertness and giving the athlete energy to perform and improves mental performance by stimulating the

central nervous system. This helps the athletes have higher levels of concentration (Magkos & Kavouras, 2005).

Using caffeine instead of other types of steroids and drugs is much cheaper and has less health effects. It also has less ineligibility cases compared to many other drugs. Being cut from a team is not the only consequence if caught using steroids or drugs, but it is also considered a felony. Therefore, many athletes should take caffeine over steroids to increase energy (Magkos & Kavouras, 2005).

Unless caffeine is taken in substantial amounts, some side effects may occur. Taking in massive quantities of caffeine may trigger dehydration that could affect functioning. It may also cause gastrointestinal pain and other side effects, such that caffeine is absorbed by the gastrointestinal tract and spread throughout the tissues of the body.

Athletes that are abusing the use of caffeine may notice an occurrence in nervousness or an increase in heart rate and may even lead up to seizures or a coma. Caffeine has to be taken with some caution, because of the possible negative side effects that could take place, but remembering to take in only what is needed will help bring out only the positive effects (Magkos & Kavouras, 2005).

Since caffeine is found in so many foods and over the counter medications, it is becoming to show an increase in all diets around the world. Many people that are trying to lose weight take caffeine pills or eat a diet that is high in caffeine for the energy, similar to those as athletes that use it to enhance performance.

Though caffeine pills should not be taken everyday and should be taken early in the day to reduce the chances of losing sleep at night. They help in increasing energy levels and suppressing hunger. This is very helpful for people who do not have the energy to get up and exercise. Some people may need that extra boost to get them started (Striegel-Moore & Franko et al, 2006).

On the other hand, it is not a fundamental nutrient, nor good for the health if taken too often. Too much can become addictive and cause problems like eating disorders, which is very common among young adults. Eating disorders, such as anorexia nervosa or bulimia are found more common among girls than in boys.

Many girls in their teens have more pressure on themselves and feel the need to lose extra weight. Consuming large amounts of caffeine will enhance their energy and suppress the need for food, or hunger. Even though they may already be thin, they will continue starving themselves because they believe they are fat. It's a constant battle that never ends and it is a very difficult disease to fight.

### **Effects on Sleep**

When caffeine is consumed in reasonable amounts, everyday consumption of it can be helpful and have many beneficial effects on human behavior and sleep showing more people with enhanced mental functioning. Imagine truck drivers who drive such long distances day and night, consuming caffeine can help stay alert and focused on the road. Many accidents occur in a year



because of people falling asleep at the wheel. Taking caffeine for better functioning reasons while driving or other reasons can be very beneficial.

Regardless of the positive effects of reducing fatigue and better functioning, there are the downfalls of consuming too much caffeine. Too much caffeine has a big effect on your sleeping ability. Sleep disorders are becoming more and more known to many children and adults because of the amount of caffeine they are taking in. Large amounts of caffeine taken at night will make it much harder to fall asleep.

People face more problems like feeling tired when they wake up or waking up in the middle of the night and not being able to fall back asleep. Although, the majority of people are very good at the amount of caffeine they take in to get the most out of the positive effects (Orbeta & Overpeck et al, 2005).

### **Effects on Human Behavior**

Rather than better mental functioning purposes and an increase in alertness, caffeine is also shown to improve many effects on human behavior. For instance, psychomotor performance is enhanced with caffeine intake. A psychomotor skill deals with being able to make movements that are essential to complete a task, however they are skills that are performed often without even thinking how they are done.

Handwriting is an example of a very difficult psychomotor skill where as people have their own unique way of writing, some using the wrist more, or maybe the elbow, or moving the whole arm as they write. Caffeine consumption can improve handwriting and reveal a much larger

improvement in handwriting skills if taken in moderate quantities (Tucha & Walitza et al, 2006).

When caffeine is consumed in so many different amounts in many types of foods, it will improve people's talent to perform certain responsibilities requiring a lot of attention. Also, when dispensed in the same amount, caffeine increases alertness and reduces fatigue. The opposing effects take place when caffeine is consumed in unbearable amounts or by people who are overly sensitive to the drug (Smith, 2002). As a result, caffeine is very helpful in which it can improve vigilance tasks and help people become more focused, so multitasking can be done.

### **Use as a Repellent**

Caffeine is also used a repellent in which many people probably didn't know. Many products for the use of mollusk control include metaldehyde or methiocarb for the main ingredients. However, both of these ingredients are highly poisonous by inhalation and to all animals. Caffeine is an all-natural product that is categorized as a generally recognized as safe (GRAS) product by the United States FDA. There have been many tests to support that caffeine is a well-proven repellent as well (Hollingsworth, Armstrong, & Campbell, 2002).

According to Hollingsworth, Armstrong, and Campbell (2002) spray applications containing one to two percent of caffeine have been reported to kill slugs during a test that experienced caffeine as a toxicant against frog pests. Another test (Figure 1) took action upon orchid snails where as they

were put into Petri dishes with caffeine while the heart rates were taken under a microscope.

Snails with caffeine concentrations of . 1% or more had vulnerable and uneven heartbeats after a 24-hour period. The snails with higher caffeine concentrations were dead after 96 hours, or four days. As a result, caffeine has been proven to kill off mollusks and would be a much safer alternative for food crops.

Taking caffeine on an everyday basis will cause the body to become addicted to the substance and cause withdrawals if missing a day. Withdrawals may include headaches or may cause a change in mood. When the amount of caffeine that is taken in is reduced, the body will become very responsive to adenosine.

The responsiveness will cause blood pressure to drop, causing an overload of blood to rush to the head, which leads to a headache. Headaches can last between one to five days and aside from such painful headaches, restlessness, irritability, and constant fatigue may occur (Smith, 2002).

All of the negative effects come from consuming too much caffeine. For that reason, if caffeine were used correctly and more sensibly, the negative effects would not take place. Negative effects on any drug can be avoided by following simple directions of not overdosing and if sensitive to the drug, don't take at all. There are so many people that abuse it and take it for all of the wrong reasons. If they took caffeine for the right reasons, they would begin to see positive effects.

## **Conclusion**

In conclusion, researchers are constantly exploring the many ways that caffeine is beneficial and has proven these effects in many cases. The main source of caffeine comes from soft drinks, in which it is an additive used to sweeten the taste. It is also very popular in coffee where it helps prevent against some diseases and has the effect of an increased attention rate and better mood.

In sports, athletes thrive off caffeine to enhance performance because it is much cheaper and has less health effects than any other drug or steroid. Becoming an increase in all foods, caffeine is also used in many diets to help increase energy. The biggest factor in using caffeine is sleep. Sleep is unwanted in many situations such as driving and other vigilance tasks. Taking caffeine helps sleep by increasing alertness and mental functioning, while reducing fatigue.

Other than increasing alertness and mental functioning, so many other effects take place in the behavior of individuals. Effects on human behavior include improving multitasking and developing psychomotor performance, such as improving handwriting skills. Another assured effect that caffeine takes part in is repelling things such as snails and slugs. It is proven much safer than other products and has been tested in many different experiments.

Caffeine has much more positive effects that overcome the negative effects. The negative effects of caffeine all come from being abused or taken in too large of quantities, meaning that more people need to understand all of the

effects. From athletes trying to enhance performance, people dieting, better functioning, an increase in alertness, to repelling things such as snails and slugs. Caffeine has many effects on the body to help improve behavior.

Looking back at all of the beneficial ways in which caffeine helps, provides all the more reasons why it is used so often.

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