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# Caffeine and You

Maxwell Young  
*Parkland College*

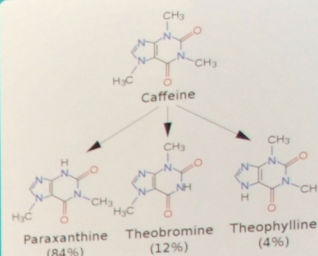
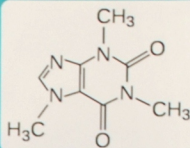
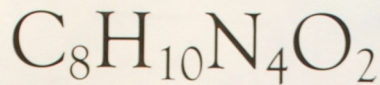
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# CAFFEINE



**Caffeine Content for Different Energy Drinks**

Brand	Volume (oz)	Caffeine (mg)
Red Bull	8.4	80
Monster	16	160
Rockstar	16	160
Energy 5	16	160
Life	16	160
Next	16	160
Shred	16	160
Sprint	16	160
Supernatural	16	160
Trident	16	160
Victory	16	160
White Bull	16	160
Yumbolt	16	160
Black Bull	16	160
Blue Bull	16	160
Green Bull	16	160
Orange Bull	16	160
Purple Bull	16	160
Yellow Bull	16	160
Black Bull	16	160
White Bull	16	160
Blue Bull	16	160
Green Bull	16	160
Orange Bull	16	160
Purple Bull	16	160
Yellow Bull	16	160

## And You

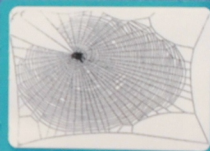
**Health effects of caffeine**

Positive effects	Negative effects
Increased alertness and attention	Primary and secondary insomnia
Increased heart rate and blood pressure	Increased heart rate and blood pressure
Lower risk of cardiovascular disease	Reduced control of the motor neurones
Lower risk of diabetes	Stimulation of vomiting
Increased metabolic rate	

Caffeine is a bitter, white crystalline xanthine alkaloid that acts as a stimulant drug. It is found in varying quantities in the seeds, leaves, and fruit of some plants, where it acts as a natural pesticide that paralyzes or kills insects that feed on the plant. Caffeine is most commonly consumed by humans in infusions extracted from the seed of the coffee plant and the leaves of the tea bush, as well as from various foods and drinks containing products derived from the kola nut.

It is important to know that caffeine is an addictive drug. Among its many actions, it operates using the same mechanisms that amphetamines, cocaine, and heroin use to stimulate the brain. Caffeine increases dopamine levels in the same way that amphetamines do. Dopamine is a neurotransmitter that, in certain parts of the brain, activates the pleasure centre. In comparison, caffeine's effects are milder than amphetamines, cocaine and heroin, but it is manipulating the same channels in the brain, which gives caffeine its addictive qualities.

Caffeine is also a diuretic, meaning that it can cause people to urinate more. This may cause dehydration if large caffeine consumption is taken alongside hot weather, during long workouts, or in situations where copious amounts of sweating is required.



**Spider Webs**

To the right is a web spun by a spider. When constructing the web, the spider first spins the spiral thread that winds from the center to the edge of the web. This is spun from the center and spins a spiral thread that connects all of the radial threads to each other. Note the uniform thickness of the thread and the even distribution of spiral threads across the entire frame.

Note on web spun by spider that has been exposed to various drugs. The to give which spider was exposed to caffeine, and let the spider to that use it again to spin.

Caffeine from coffee or other beverages is absorbed by the small intestine within 45 minutes of ingestion and then distributed throughout all tissues of the body. Peak blood concentration is reached within one hour.

Caffeine is metabolized in the liver by the cytochrome P450 oxidase enzyme system into three metabolic dimethylxanthines, each of which has its own effects on the body:

- Paraxanthine (84%): Increases lipolysis, leading to elevated glycerol and free fatty acid levels in the blood plasma.
- Theobromine (12%): Dilates blood vessels and increases urine volume. It is also the principal alkaloid in the cocoa bean (chocolate).
- Theophylline (4%): Relaxes smooth muscles of the bronchi, and is used to treat asthma. The therapeutic dose of theophylline, however, is many times greater than the levels attained from caffeine metabolism.

### What does this mean? →

This was a study done by NASA to see the effects of psychoactive drugs on animals. They used spider webs because they showed a very clear graphic representation of how different drug affect behavior. The study is both interesting and surprising because the web spun by the spider that was exposed to caffeine is much poorer in quality than most other drugs. The spider web was exposed to LSD still spun an almost normal web, while the caffeine web is a chaotic mess.

**Terahydroxanthine, or 1,7-ND, is the major psychoactive compound in marijuana. Spiders exposed to 100 mg/kg spun webs that were 40% smaller than control webs. The concentration needed for a spider web to be significantly smaller than control was 100 mg/kg.**

**Marijuana, which is derived from certain species of hemp, has effects similar to the drug LSD. Spiders whose webs were exposed to marijuana failed to spin parts of their web. On the right hand side of the web, almost a third of the web is missing due to the lack of radial threads. Note that the web is much weaker than a control web.**

**Caffeine 10% of North American countries consume caffeine daily. Caffeine is found in coffee, soft drinks, and medicines. Spiders that were exposed to caffeine had normal metabolic and spin webs like control (paraxanthine), however their spiral threads were smaller.**

**Chloral hydrate is synthesized from ethylene and is commonly used as an active ingredient in sleeping pills. Spiders that were exposed to the same concentration (100 mg/kg) as control webs, which also were abnormally thick. Upon prior using a prior job (resembling the frame), the spiders felt better.**

By Maxwell Young | Chem 101

**Caffeine and animals**  
Young, J., J., A., & J.  
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Seymour R. J. Glavin, and R. A. Roberts, *Non-Sedative Anesthetics*, 1996, 1975, pp. 5  
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**Spiders 8**  
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**Spiders 9**  
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**Spiders 10**  
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**Spiders 11**  
Chem webs, made in Pharmacy

**Text 8**  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6148488/>  
"Caffeine Poisoning"

**Text 9**  
Seymour R. J. Glavin, and R. A. Roberts, *The World of Caffeine: the history and culture of the world's most popular drug*, Boulder, CO, 1996, pp. 211-216, ISBN 0819572214