

ENERGY DRINKS: HARMFUL OR HELPFUL?

Caffeine: An Overview

If someone asked how much caffeine you consume each day could you give them an accurate answer? Manufacturers are not currently required to list the caffeine content of foods or beverages on nutrition labels, so it can be difficult to determine how much caffeine you have each day.

Most of us know that excessive intake of caffeine may cause a racing heart rate and headaches, but did you know that it can also cause anxiety, increased blood pressure, heart palpitations, insomnia and, in extreme cases, nausea and vomiting (1)? People are sensitive to caffeine at all different levels, but the general guideline is to try to **consume less than 300mg caffeine (equivalent to about 3, 8oz. cups of coffee) daily**. Although some of these symptoms sound fairly miserable, the good news is that in small to moderate amounts, caffeine has actually been shown to increase concentration and mental alertness (2). To maximize the benefits of caffeine and minimize side effects, it is best to spread out your caffeine intake throughout the day. Large caffeine doses in short periods of time only add to an “energy boost” followed by a “crash”. Check out the Caffeine Ranges for Common Beverages table to get a better idea of what your average caffeine intake may be.

Caffeine Ranges for Common Beverages*

Beverage	Serving Size	Caffeine Range (mg)
Coffee, drip	8 fluid oz.	104-192
Tea, brewed	8 fluid oz.	20-90
Iced Tea	8 fluid oz.	9-50
Soft Drinks	8 fluid oz.	20-40
Cocoa Beverage	8 fluid oz.	3-32
Milk Chocolate	1 oz.	1-15
Dark Chocolate	1 oz.	5-35

*Barone JJ, Roberts HR. Caffeine Consumption. *Food and Chemical Toxicology*. 1996; 34: 119-129.

Caffeine in Energy Drinks

Despite what energy drink companies may want you to believe, it appears that a good bit of the “energy jolt” you feel after having an energy beverage may come primarily from high doses of caffeine (2). While some beverages contain roughly the same amount of caffeine as a cup of coffee, others contain close to double. Also, like any caffeine-containing beverage, undesirable side effects can occur when consumed in excess.

Caffeine Content of Energy Drinks**

Energy Drink	Serving Size (fl. oz.)	Caffeine (mg)
Amp	8.4	74
Cocaine	8.4	280
Enviga	12	100
Full Throttle	16	144
Monster Energy	16	160
Red Bull	8.3	80
Red Bull Sugarfree	8.3	80
Rip It (all varieties)	8	100
Rockstar Energy Drink	8	80
SoBe Adrenaline Rush	8.3	79
SoBe No Fear	8	83
Spike Shooter	8.4	300
Tab Energy	10.5	95

**<http://www.cspinet.org/new/cafchart.htm>

Other “Energy” Ingredients

Energy drink companies advertise a wide variety of added ingredients, in addition to caffeine, that supposedly make their product supply more “energy” than their competitors. Some of the most common ingredients include carnitine, ginseng, guarana and taurine, but you may also see various antioxidants, B-vitamins and herbs (2). Much controversy surrounds these additives and, unfortunately, very few claims have been backed by scientific evidence. Although some claims have been confirmed, there is little to no current research that has looked at the combination of the above named additives with each other or with caffeine. Also, safe intake levels have not been established. We currently know what intake level can be toxic or cause ill effects for many vitamins and minerals; however, any ingredient that is deemed a “supplement” may not have the same research and regulations attached with it since energy drinks (and their ingredients) are not regulated by the U.S. Food and Drug Administration (FDA). Overall, little is known about the so called “pick me up” blends and it is wise to exercise caution when consuming beverages containing “energy” or “performance enhancing” additives. Also, keep in mind that the added ingredients warrant a steep price increase when compared to other caffeinated beverages.

Ingredient	Type of Substance	Claims	Science-Based Evidence of Claims	Possible Side Effects & Cautions
Carnitine (2)	Amino acid derivative required for beta-oxidation of fats	Burns fat & increases stamina	None supported	Nausea, vomiting, abdominal pain, diarrhea & increased seizures in those with seizure disorders
Ginseng (2,3)	Herb	Improved mental and physical performance, lowers blood glucose, controls blood pressure	Not conclusive, but may lower blood glucose & help immune function	Headache, sleep difficulty, gastrointestinal problems, allergic reactions, menstrual irregularities, high blood pressure, low blood glucose, insomnia & irritability
Guarana (2)	Caffeine containing seed derivative	Stimulant	Similar effects to caffeine	May have longer lasting effects than caffeine due to the saponins and tanins it contains
Taurine (2, 4)	Essential amino acid	Improved athletic performance, improved mental performance, maintenance of eye health & prevention of chronic heart failure	Supports neurological development, regulates water & mineral salts in the blood (when consumed in foods that <i>naturally</i> contain taurine; not much is known about taurine as a <i>supplement</i>)	Anxiety, irritability, high sensitivity to noise & self mutilation (only found in rat specimens so far)

Watching Your Waistline

Just like soda and other sugar-containing beverages, energy drinks are a substantial source of empty calories. On average, energy drinks contain a similar amount of sugar and calories to soft drinks, but brand and serving size both contribute to a variety of contents. Sugar-free varieties are also available, but you must remember that even though the sugar may be reduced, you may be displacing more healthful beverages such as milk and 100% juice.

How Can I Increase My Energy Level Without Energy Drinks?

Many people feel like they can't make it through the day without some type of "energy boost". Although energy drinks may help to provide that much needed pick-me-up, it is advisable to seek other healthy lifestyle modifications that can help to increase your energy level. Try some of these helpful tips:

- **Get plenty of sleep!** It can be difficult as a college student to set aside enough time to get a good night's rest, but your body will thank you if you do. It is recommended that you get **9 ¼ hours** of sleep each day, although **8 ½ may be enough for some** (5).
- **Try to get on a schedule.** Make your daily routine similar (even on the weekends). Going to bed and waking at about the same time each day may help you to fall asleep more easily (5).
- **Get organized.** If you plan out what you need to accomplish you will find yourself “cramming” a lot less which will reduce your stress level and help you to get plenty of sleep before exams or projects are due.
- **Eat a balanced diet.** We have all heard this one, but there really does seem to be a correlation between what we put in our bodies and how we feel.
- **Make time for exercise.** With an already busy schedule it can be tough to fit in exercise time, but getting **30 minutes of exercise on most days of the week (at least 5)** can increase your energy level and help to reduce stress (6). You may try getting a short walk or other type of exercise in the morning to give you that daily “boost”.
- **Limit your caffeine intake.** If you have trouble sleeping, chances are, you may be consuming too much caffeine. Try not to have your caffeinated beverages too late in the day if you find that it affects your ability to go to sleep.

FAQ

Q: How many energy drinks are safe to drink at once?

A: While there is no magic safe number of energy drinks that can be consumed at once, it is advisable to spread out your caffeine intake over longer periods of time to reduce unwanted side effects of excessive caffeine intake. It is also wise to only drink energy drinks on occasion since we don't know what the safe levels of the added ingredients are or what long-term effects may occur from energy drink consumption.

Q: Is it okay to mix an energy drink with alcohol?

A: Mixing energy drinks with alcohol has soared in popularity recently, but it is not considered a safe practice to combine these two beverages. Caffeine is a stimulant and alcohol is a depressant. The combination is thought to lessen the amount of intoxication a person feels however this does not mean you are less intoxicated (7). Also, the combination of two substances that act as diuretics may cause dehydration (8).

Q: Is it a good idea to drink an energy drink before playing sports?

A: Caffeine acts as a mild diuretic. Although it may provide a pre-event “pick-me-up”, dangerous levels of water loss can lead to serious health problems brought on by dehydration (8). Try water prior to and during short or less strenuous physical activity. Sports drinks may be helpful when exerting high levels of physical activity or during extended workout periods.

Additional Reading & Resources

- <http://www.ific.org/publications/brochures/caffeinebroch.cfm>
- http://www.sleepfoundation.org/site/c.hulXKjM0lxF/b.2419127/k.9C6C/Sleep_and_Teens.htm
- <http://family.samhsa.gov/monitor/energydrinks.aspx>

Babu KM, Church JC, & Lewander W. Energy Drinks: the new eye-opener for adolescents. *Clinical Pediatric Emergency Medicine*. 2008; 9:35-42.

Mosher J & Simon M. Alcohol, Energy Drinks, and Youth: A Dangerous Mix. The Marin Institute. 1-21.

References

1. Babu KM, Church JC, & Lewander W. Energy Drinks: the new eye-opener for adolescents. *Clinical Pediatric Emergency Medicine*. 2008; 9:35-42.
2. International Food Information Council (IFIC). Everything You Need to Know About Caffeine. 1998. Available at: <http://www.foodinsight.org/Content/6/caffeinebrochure.pdf>. Accessed May 13, 2010.
3. National Center for Complementary and Alternative Medicine. Herbs at a glance: Asian ginseng. Available at: <http://nccam.nih.gov/health/asianginseng/>. Accessed November 3, 2008.
4. Zeratsky K. Taurine in energy drinks: what is it?. Available at: <http://www.mayoclinic.com/health/taurine/AN01856>. Accessed November 4, 2008.
5. National Sleep Foundation. Sleep and Teens. Available at: http://www.sleepfoundation.org/site/c.hulXKjM0lxF/b.2419127/k.9C6C/Sleep_and_Teens.htm. Accessed November 13, 2008.
6. Centers for Disease Control and Prevention (CDC). Physical Activity for Everyone. Available at: <http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html>. Accessed November 13, 2008.
7. Mosher J & Simon M. Alcohol, Energy Drinks, and Youth: A Dangerous Mix. The Marin Institute. 1-21.
8. U.S. Department of Health and Human Services. Energy Drinks: Power Boosts or Empty Boasts? Available at: <http://family.samhsa.gov/monitor/energydrinks.aspx>. Accessed November 13, 2008.