



Energy Drinks: Are They Healthy for Children?

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Introduction

Energy drinks are types of beverages that contain stimulants and are aimed at improving mental alertness and concentration and providing physical stimulation, such as optimizing athletic performance. They are different from sports drinks, which generally do not contain stimulants.

Energy drinks are increasingly popular in the U.S. People drink them to combat fatigue, feel more energetic, lose weight, and/or improve athletic performance. It is concerning that their use is becoming increasingly common among children and teens who may be emulating celebrities and sports stars. These children may end up getting more than they bargained for, including large amounts of caffeine, added calories, and other additives with unknown effects or consequences.

Caffeine in Energy Drinks

Some cans or bottles of energy drinks have caffeine levels in excess of 500 milligrams (mg), the amount in more than 14 cans of soda or about five cups of coffee. Each can of cola has about 35 mg of caffeine, while a cup of coffee has approximately 100 mg.

What's more troubling is that labels for these drinks are not required to list how much caffeine is in each serving, contributing to more confusion. In 2012, a Consumer Reports study found that of 16 energy drinks that disclosed the amount of caffeine they contained, five had 20 percent more caffeine than claimed (Consumer Reports 2012).

Compounding the misperceptions and uncertainties is that the Food and Drug Administration does not regulate many energy drinks because they can be considered dietary supplements, although a few companies now market their drinks as beverages. There are no

regulations for selling energy drinks to children, putting labels on products, or testing the products for safety. Also, the typical serving size for an energy drink may be 8 ounces, while the actual product size is double that amount, thereby providing twice the amount of calories and caffeine.

“Energy drinks pose potential health risks primarily because of stimulant content; therefore, they are not appropriate for children and adolescents and should never be consumed.”

— American Academy of Pediatrics (2011, 1188)

Children and teens do not need caffeine, and it may be best to avoid caffeine consumption altogether. If youth do consume caffeine, the American Academy of Pediatrics has set a maximum consumption level of 3 mg per kilogram or just over 1.3 mg per pound of body weight. The organization recommends that if caffeine is consumed, youth should not exceed 2.5 mg per kilogram of body weight a day (i.e., about 1.1 mg per pound) from all dietary sources of caffeine (Seifert et al. 2011). This is about 38 to 45 mg per day for a 1- to 5-year-old weighing 33 to 40 pounds, and 88 to 125 mg per day for a 10- to 14-year-old weighing 77 to 110 pounds. Depending on dietary choices, this equates to one can of Coca-Cola or Diet Coke for a 1- to 5-year-old and 12 ounces of Monster or Rockstar energy drinks for a 10- to 14-year-old. Again, these drinks are not suggested for youth. Table 1 has the caffeine content of common coffees and energy drinks.

Some common symptoms of excessive caffeine intake are irritability, noticeably increased or irregular heart-beat, stomach upset, insomnia, restlessness, changes

Table 1. Caffeine content of some common coffees and energy drinks.

Beverage	Serving size in ounces	Caffeine content in milligrams
“Tall” Starbucks coffee	12	260
Maxwell House ground coffee, 100% Colombian, dark (using 2 tablespoons)	12	100-160
Folgers Classic Roast instant coffee (using 2 tablespoons)	12	148
Large McDonald’s coffee	16	133
Mountain Dew (regular or diet)	12/20	54/90
Diet Coke	12/20	47/78
Coca-Cola, Coke Zero, Diet Pepsi	12/20	35/58
5-Hour Energy	19	208
Monster Energy	16	160
Rockstar	16	160
Red Bull	8.4	80
Glacéau Vitaminwater Energy	20	50

in blood pressure, and nervousness. More serious complications seen with very high caffeine consumption include seizures, low blood potassium levels (an electrolyte involved with heart rate), stroke, and even death. Additionally, withdrawal symptoms can occur even after one high dose of caffeine and can include headache, fatigue, and a reduced ability to concentrate.

Other Additives in Energy Drinks

Aside from caffeine, the most common ingredient, energy drinks often contain taurine, ginseng, and guarana, which may act as stimulants or even have “hidden” caffeine in them. For example, there are about 40 to 80 mg of caffeine per gram of guarana, a plant extract commonly added to some sports drinks (Seifert et al. 2011). The problem with these additives in youth is that their full effects are unknown; research on energy drinks and their ingredients is lacking, and conclusions are often conflicting. For instance, concentration was found to be the same after caffeine or carbohydrate ingestion, meaning that caffeine was not any better than one of

our main sources of quick energy, carbohydrates. Some research has linked excess caffeine to an irregular heart rate, sleep disturbances, anxiety, and increased blood pressure in adolescents and children. Furthermore, the American Academy of Pediatrics (2011) notes that excessive caffeine, most notably from excessive energy drink consumption, has been responsible for deaths in Germany and Ireland.

Another additive that has similar properties to and can amplify the effects of caffeine is taurine, which can increase blood pressure and heart rate (American Academy of Pediatrics 2011). Those with congenital heart conditions or who are on medications for ADHD/ADD and depression should be cautious because these effects may lead to fainting, abnormally high blood pressure, or even death (Seifert et al. 2011). Although their exact effects are unknown, stimulant additives are thought to improve concentration and alertness and extend time to exhaustion while exercising. Table 2 has a list of some common additives to energy drinks, their proposed claims, and evidence supporting them.

Table 2. Common additives to energy drinks, what they are, and their proposed effects.

Additive	What it is	What it is thought to do	Evidence
Ginseng	An American perennial herb.	Improves immunity and mental and physical performance while increasing endurance and overall feelings of well-being.	Actions in energy drinks are unknown.
Guarana	South American plant that is higher in caffeine content per gram than coffee beans.	Increases energy, concentration, alertness, and exercise performance (all similar to caffeine).	Physiological effects from consumption in energy drinks are unknown.
Taurine	An amino acid found in foods like beef, pork, and chicken with the highest amounts in shellfish and fish. This plays a role in mineral salt and water balance in the blood and supports neurologic development.	Improves physical and mental performance when used in combination with caffeine.	When combined with caffeine, it has been shown to increase heart rate, stroke volume, and blood pressure in humans. Long-term use of taurine in humans and animals shows a risk for developing low blood sugar.
Yohimbine	An alkaloid (basically a chemical from plants) that can have many different effects; it's typically considered an herbal supplement.	Improves endurance and increases energy and metabolism.	Studies in animals suggest that it can increase oxygen consumption; however, insulin, resting heart rate and blood pressure also increased.

Nutrient Content in Energy Drinks

Energy drinks also offer varying amounts of protein, carbohydrates, and vitamins. Red Bull, for example, has more than 350 percent of the recommended daily allowance (RDA) for vitamin B-6, 140 percent of niacin (vitamin B-3), and 120 percent of vitamin B-12; 5-Hour Energy has more than 8,000 percent of the RDA for vitamin B-12 and 2,000 percent for B-6. While these vitamins serve a function within the body, megadoses don't provide any added benefit, especially in terms of energy: If a person is healthy, excess B vitamins are released in the urine. An adult weighing approximately 155 pounds can meet the RDA for vitamin B-12 with 3 ounces of lean beef or for vitamin B-6 with a few servings of milk or a bowl of fortified cereal (Gidding et al. 2006).

Conclusion

The combined effects of energy drinks are widely unknown, especially in youth. Excessive caffeine has the potential to cause cardiovascular and neurological problems that may be even more pronounced in those on certain medications or with genetic heart conditions. In children and teens, research is not sufficient to say that energy drinks can provide an added benefit to a balanced diet and adequate rest. Further, the ingredients of energy drinks themselves are not regulated, so a person cannot assume that if it's on the market, it's safe.

The American Academy of Pediatrics (2011) recommends that children and adolescents not consume energy drinks. Advertisements may be convincing, but before turning to energy drinks for a pick-me-up, consider healthier and cheaper alternatives like drinking water, eating a balanced diet based on MyPlate (www.choosemyplate.gov), and obtaining enough sleep.

References

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