Are Energy Drinks Worth the Buzz?

By Samantha Marquis '14

When Megan Groce needs a morning pick-me-up, the 16-year-old doesn't reach for coffee. Instead, she stops by the nearest convenience store on the way to school to grab an energy drink. "I'm really sleepy, so I buy the biggest one the store has, to help me wake up." If you walk down the hallways of Megan's high school in Katy, Texas, she says you'll see most students clutching an energy drink. (Crane 2)

Over the past few years energy drinks have become more and more popular among teens and college students. But in reality, these drinks are not just a "pick-me-up." A lot of consumers are unaware of the ingredients in energy drinks and the risks associated with them. One drink, for instance, Cocaine, contains 280mg of caffeine, not even including the herb Guarana, which also adds an additional 40mg of caffeine. That is a total of over 320mg of caffeine in one 8.4 ounce serving (Fornicola 38). The United States Food and Drug Administration recommends that no drink contain more than 65mg of caffeine per 12 ounces (Crane 22). The main issue is that most of the people who are consuming energy drinks do not even know just what they are drinking or how harmful they are.

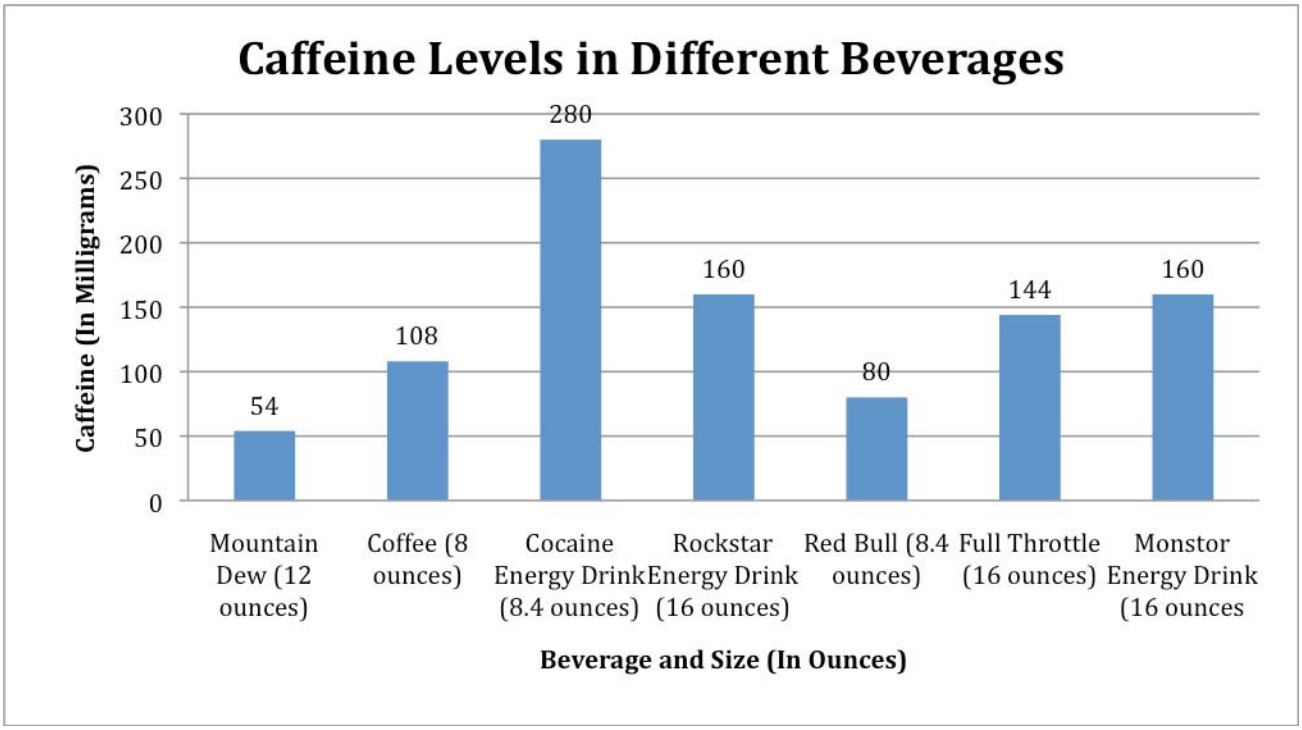
Energy drinks are soft drinks that promise to give your body a boost of energy. Some of the popular energy drinks are Rockstar, Red Bull, Full Throttle, and Monster. The question is, what is in these drinks that provide that boost of energy? Along with the main ingredient, caffeine, other leading brands (but not all) have additional ingredients that are barely pronounceable. So behind the label of a Red Bull the active ingredients are

carbonated water, sucrose, glucose, acidity regulator (sodium citrates), taurine, Glucuronolactone, caffeine, inositol, vitamins (niacin, pantothenic acid, B6, B12), flavorings, colors (caramel, riboflavin).

Sucrose and glucose are simple sugars; they are metabolized quickly by the body and produce a quick energy burst, followed by a deep energy deficit. High intake of sugar raises blood fat levels and removes essential minerals from the body, leading to deficiency diseases and immune system impairment. Taurine is an amino acid, but there have not been any human studies that examined chronic toxicity associated with long-term intake of taurine. But in animals it can produce a decrease in body weight and dehydration. High intake of taurine is associated with liver dysfunction in rats and guinea pigs. Glucuronolactone is a carbohydrate, but no human study has been conducted on it, so its usefulness and possible adverse effects remain a mystery. Caffeine increases the heart rate and blood pressure and raises the level of harmful stress hormones in the bloodstream. In high doses, caffeine is dehydrating, addictive, and can reduce functions of the body's immune response. In pregnant women, high caffeine intake is associated with increased risk of miscarriage. The flavorings in Red Bull adds flavor, but these synthetic flavorings can be a mix of several industrial chemicals. These additives are essentially the same chemicals used in perfumes and are considered neurotoxins, allergens and potential carcinogens. Then the last main ingredient is the caramel, which adds color to the overall drink. Caramel is produced by ammonia process and is a common food coloring. There is evidence that it may damage genes, slow growth, cause enlargement of the intestines and kidneys, destroy vitamin B and cause hyperactivity (Thomas 15). The problem with these

additives is we do not know the quantities energy drinks contain or how they react in the body.

Energy drink consumption has continued to gain popularity since the 1997 debut of Red Bull (Malinauskas 1). But the first energy drink was released in the 1980s in North America, Jolt Cola (Fornicola 38). These beverages are targeted to young adult consumers, primarily high school and college students. Many teens love the sweet flavors, revved-up names, and the flashy cans.



Source: Foster, James and Kallmyer, Ted. "Caffeine Content of Drinks." *Energy Fiend*. Energyfiend.com, 10 Oct. 2010. Web. 07 Dec. 2010.

Those are the main reasons that adolescents choose energy drinks, but what are the other reasons that they consume energy drinks? In a survey of 496 college students, 51 percent reported drinking more than one energy drink each month. Insufficient sleep was the main reason that 67 percent of those college students claim to drink energy drinks; 65

percent drink them to increase their energy; 54 percent consume them with alcohol while partying; 50 percent drink them while studying or completing a major course project; 45 percent drink energy drinks while driving a car for a long period of time; and 17 percent of the college students surveyed said that they drink energy drinks to treat hangovers (Malinauskas 3).

In addition to the reasons reported above, people consume energy drinks because the consumption of glucose and caffeine can improve cognitive performance. Improvements were also seen on the secondary memory factor and the speed of attention factor. Energy drinks lead to improvements of performance. When the drink contains only glucose, there is a lack of direct, selective enhancement of declarative memory tasks. But, when a modest amount of caffeine is added to the mix, it improves the performance of such tasks (Scholey 327).

On the opposite side, some people are against energy drinks. When I first arrived at Colby-Sawyer, my friend Mike Cocce expressed his discontent to me about my drinking energy drinks. He felt very strongly about the issue. Mike explains, “I have never drunk an energy drink, because when I was two years old I was diagnosed with a heart condition, prolonged QT syndrome. If I did not have a heart condition I still would not drink energy drinks; they are constantly messing with people’s heart rate, speeding it up and making it irregular, causing palpitations., Basically it takes years off people’s lives when they drink them. I don’t really care who consumes these products. I just hope that they know what the consequences are going to be” (Cocce).

Smit and colleagues found that energy drinks, as compared to placebo, had energizing effects among 18 to 55 year old participants, with effects being strongest 30 to

60 minutes after consumption and sustained at least 90 minutes (Malinauskas 2). The main source of the energy is due to the caffeine. Low doses of caffeine (12.5 to 100mg) improve cognitive performance and mood. In 2001, Warburton and Bersellini investigated the effects of an 80mg/250ml caffeinated taurine drink. Participants who ingested the caffeinated drink showed improved attention and accuracy. They also demonstrated faster reaction times. Caffeine improves cognitive performance by stabilizing normal fluctuations in arousal (Curry 474).

As stated above, low doses of caffeine improve cognitive performance and mood;, however, too much of a good thing, used improperly, can be detrimental. "The majority of energy drink consumers drink one to treat a hangover, for insufficient sleep, to increase energy, and while driving a car for a long period of time. Using three or more was a common practice (49 percent of users) to drink with alcohol while partying" (Malinauskas 4). With this information in mind, the marketing teams of these energy drinks publicized the idea of mixing their energy drinks with alcohol. They make them very appealing to young drinkers, fruit-flavored, and often sold in bright colored cans, with intriguing names. However, this combination is not ideal. Energy drinks are mainly made up of caffeine, which is a stimulant, and on the other hand, alcohol is a depressant. So when the two are mixed, it creates a dangerous combination. Caffeine has only been approved as an additive in soft drinks (Curry 475). The stimulant effects from the energy drink have the ability to mask how intoxicated a person is becoming. In this case, blood alcohol concentrate (BAC) can exceed legal and health related levels (Fornicola 3). Washington State put an emergency ban on alcoholic energy drinks that took effect on November 18, 2010. Washington's rule targets beer-based drinks that also feature caffeine, such as the drink

Four Loko. “Nine Central Washington University students who drank Four Loko were hospitalized with blood-alcohol levels ranging from 0.12 percent to 0.35 percent, and a female student nearly died…A blood-alcohol concentration of 0.30 percent is considered lethal” (Woodward 1). The legal level in New Hampshire is a 0.08. On November 16th, the manufacturer of Four Loko announced that they were going to reformulate their product and remove caffeine, guarana and taurine. The company also agreed to voluntarily cease sales in New York. Following the Four Loko issue, the FDA also plans to rule caffeine as an unsafe substance to add to alcoholic beverages. In result to that, alcoholic energy drinks will be prohibited for sale in the United States (Johnson 1).

While it is very rare to see serious side effects from even large amounts of caffeine, they can occur. That has always been true, but what is changing is that more and more products now contain enormous amounts of caffeine, so it is easy to overdose without even knowing it. This is the case in many emergency rooms around the globe. “A cardiologist from Chicago reported the case of a healthy 23-year old woman who was brought to the emergency room because of palpitations and chest tightness shortly after she drank GNC Speed Shot and a Mountain Dew soft drink” (“Caffeine” 2). In this woman’s case, her heart rate was dangerously high and the doctors had to give her medicine to get it back to normal. But all she did wrong was consume two drinks that both contained caffeine. When people drink a soda, caffeine may not be the first ingredient to pop into their heads as it does for energy drinks, yet many sodas contain high amounts of caffeine. Mountain Dew has only twelve more milligrams of caffeine than Coco-Cola does (Foster 1). It is important for people to be more aware of the potential effects of these energy drinks, alone and in combination with other caffeinated products.

A study was conducted after three Swedish people suddenly died after consuming energy drinks and then exercising. The question that arises from this is whether the intake of energy drinks with physical exercise, and possibly also in combination with alcohol, could increase the risk of sudden death. The study investigated whether consumption of energy drinks—alone or in combination with maximal bicycle exercise caused any changes in the ECG (electrocardiogram) or HRV (heart rate variability). Physical exercise reduces HRV, and increases the heart rate, stroke volume, and myocardial contractility. In this study none of the subjects developed any significant arrhythmias during post-exercise recovery. "We hypothesize that in predisposed individuals the blunted vagal reactivation, caused by the combined intake of energy drink and alcohol, might be arrhythmogenic. Reduced HRV has been linked to the degree of autonomic neuropathy in diabetic patients and linked with the risk of sudden death" (Wiklund 78). The majority of people who die because of sudden cardiac death have a pre-existing disease; however, it is not known if any of the reported deaths after energy drink intake were a result of these diseases.

Some other factors that affect people who drink energy drinks are weight, prior health conditions, and how much of a product is consumed. There is a web site that has a "Death by Caffeine" calculator, which is a way of drawing attention to caffeine consumption and how important moderation is. On the web site a site visitor can put in his or her weight and their favorite energy drink and it will tell them how many energy drinks it would take to kill them. The number it takes varies depending on how much the site visitor weighs. The people who die from caffeine or face issues from drinking caffeine usually have underlying health problems to begin with but that is not necessarily always the case (Foster 1).

When Michael Alterisio was born, the part of his heart that is supposed to close up didn't. Later in life it eventually closed up but he still experiences issues. He describes it as like heartburn. "Everything going on around me is suddenly out of the picture and all I can focus on is my heart beating painfully each beat." His doctors advised him not to consume energy drinks, but he didn't believe that it would actually affect him. He realized later they were right. The pain he had previously experienced was intensified, and his heartbeat was more rapid. He said, "I legit thought I was having a heart attack. I also got dizzy and almost passed out after working out" (Alterisio).

The issue of whether people consume caffeine for leisure or a purpose is a controversial topic. "Caffeine is the most commonly used psychoactive drug in the world, consumed daily by approximately 80 percent of the world's population… Caffeine consumption from all sources reaches 210-238mg/person per day in the USA and Canada and more than 400mg/person per day in Sweden and Finland" (Ogawa 263). The Diagnostic and Statistical Manual of Mental Disorders, 4th edition covers all mental-health disorders for both children and adults. There is a proposed diagnosis of caffeine withdrawal, but there is not an official diagnosis (Kovacs 2). "A review and analysis of the effects of caffeine absence in humans claims that the withdrawal symptoms include headache, tiredness/fatigue, decreased energy/activeness, decreased alertness/ attentiveness, drowsiness/sleepiness, decreased contentedness/well-being, depressed mood, difficulty concentrating, irritability, and muzzy/foggy/not clear headed" (Kovacs 2). When I first arrived at Colby-Sawyer I had been drinking one to three Red Bulls a day, up until about two weeks ago. I have been experiencing multiple symptoms of caffeine withdrawal, because that was my main source of caffeine. Now, I do not really consume any

caffeine because I do not drink soda or coffee. So basically, people cannot just stop consuming caffeine all together but it is unhealthy to consume multiple energy drinks in a given period. But there is caffeine in other drinks and also in food so people could change the source of caffeine to maintain a healthier diet.

The main issue with energy drinks is that most of the people who are consuming them do not know what they are drinking. They drink them for various short-term reasons without knowing just how hazardous these drinks actually are. Energy drinks may seem like a perfect short-term answer, but they could get people into a cycle of relying on energy drinks to keep them going. What I have come to realize is that it is not worth it. All of the additives that companies put in these drinks are not healthy for the human body. So from now on, I am not drinking energy drinks anymore. When I get over the withdrawal symptoms, it will be worth it. The next time that anyone goes into the store to buy an energy drink, I will advise him or her to ask, “Is the buzz worth it?”

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