Alcohol Mixed with High Levels of Caffeine: What Campus Professionals Need to Know

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Introduction

Over the past few months, there has been much media attention on popular caffeinated malt beverages like Four Loko. However, researchers, policy makers, and health professionals have expressed concern over caffeinated malt beverages and mixed energy drinks for several years. Since the introduction of energy drinks to the United States such as Red Bull in 1997 and its subsequent use as a mixer for hard alcohol, there is a growing body of research evidence indicating that mixing alcohol with high levels of caffeine and other substances contained in energy drinks is unsafe. Policy makers are also concerned about the inappropriate marketing of these beverages to a younger audience. Although Four Loko is the center of recent controversy, there are several other beverages on the market with similar alcohol and caffeine content (Joose, Max), as well as highly caffeinated beverages often used to mix with alcohol (e.g., Red Bull, Monster) that have the potential for abuse.

Health concerns: How is this more dangerous than a Rum and Coke?

In reviewing the recent news articles on Four Loko, readers and the producers of Four Loko indicated that if consumed responsibly their beverages are no more dangerous than an Irish Coffee or Rum and Coke. The U.S. Centers for Disease Control and Prevention (CDC) defines binge drinking as reaching a Blood Alcohol Level above a .08. For most men this means consuming five or more beverages over a two hour period of time and four or more for women (CDC 2010). According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA) just one 23 ounce can of caffeinated malt beverage, such as Four Loko, Joose, or Max, can contain the equivalent amount of alcohol as just under five drinks. (NIAAA, 2010). Therefore, consuming one can meets the definition for binge drinking for women and is just under the definition for men. This amount of alcohol is risky with or without the combination of caffeine.

The following chart compares the level of caffeine and alcohol in mixed drinks and the formerly produced caffeinated alcoholic drinks. Premixed malt beverages can contain up to four times the amount of caffeine and up to five times the amount of alcohol than a standard serving rum and coke. A standard serving mixed alcohol energy drink contains up to four times the amount of caffeine than a standard rum and coke. It is also important to keep in mind that alcoholic energy drinks are not required to list the amounts of their ingredients nor is their production regulated to ensure accurate reporting.

	Mixed caffeinated soft drink with 1 shot worth of alcohol (e.g., rum and coke)	Energy drink and 1 shot worth or alcohol (e.g., Redbull and vodka)	Caffeinated Malt Beverages (e.g., Joose, Four Loko)
Number of standard drinks	1	1	3-5
Average amount of caffeine	30-40 mg	80-160 mg	~180mg * **Amounts are undisclosed and hidden by other stimulants such as guarana which also contain caffeine. Alcoholic energy drinks are not required to list the amounts of their ingredients.*
Additional stimulants	no	yes	yes

Dangers of too much caffeine

The American Dietetic Association (ADA) reports that for most healthy adults, consuming 200-300 mg of caffeine is not harmful. However, consuming higher levels of caffeine can result in irregular heart rate, dehydration, headaches, anxiety, restlessness, an inability to concentrate, and stomach upset (ADA, 2010). McCusker, Goldberger, and Cone (2006) found that energy drinks can contain up to 300 times the amount of caffeine than the FDA allows for soft drinks.

Some students choose to pre-game with energy drinks in hopes of staying up longer and diminishing the effects of alcohol. Others choose to drink alcohol mixed with energy drinks (e.g., Red Bull and vodka) all night long. Still others choose to drink the pre-mixed malt beverages containing both caffeine and alcohol. Consuming three or more alcoholic energy drinks can result in the ingestion of dangerous levels of caffeine.

In addition to the risk of ingesting larger quantities of alcohol and caffeine, health professionals are also concerned about the following:

- Both alcohol and caffeine are diuretics. Combining the two may dehydrate the body at a faster rate. This can make individuals more susceptible to alcohol toxicity.
- Caffeine may trick individuals into feeling less drunk. This may cause people to drink more alcohol or make risky decisions such as driving a car because they do not feel drunk.
- Energy drinks are loaded with calories and sugar that the body may not need. For example, the Daily Burn (2010) reported that one can of Four Loko contains 660-700 calories and 60 grams of sugar.
- Students may choose to abstain from eating food prior to a drinking event in order to consume fewer calories, particularly when planning to drink high calorie beverages.
- Consuming these beverages may also cause an imbalance of blood glucose levels.

Research evidence suggests potential for harm

Recent media reports have provided anecdotal data suggesting harmful consequences can occur from mixing alcohol with high levels of caffeine. Additionally, colleagues at institutions of higher education have reported high risk incidents where students had consumed highly caffeinated malt beverages. Below is a snapshot of implications reported in research concerning the mixture of alcohol with high levels of caffeine.

Students who mixed alcohol and energy drinks reported double the incidence rate of injuring themselves, requiring medical attention, and being taken advantage of sexually than those who drank only alcohol. (O'Brien, McCoy, Rhodes, Wagoner, & Wolfson, 2008)

Participants who consumed alcohol with energy drinks had higher BACs (blood alcohol content) than participants who did not. They were also four times more likely to drive while intoxicated. (Thombs, O'Mara, Tsukamoto, Rossheim, Weiler, Merves, & Goldberger, 2010)

Mixing alcohol with an energy drink reduced participants' perception of intoxication however impairment of motor skills and visual reaction were still diminished (Ferreira, de Mello, Pompeia, & de Souza-Formigoni, 2006).

The quantity of alcohol consumed by students drinking alcoholic energy drinks is greater than the amounts consumed by students who drink traditional alcoholic beverages. Alcoholic energy drink consumption is a statistically significant predictor for negative consequences including physical altercations, missing classes, or falling behind in school work, black outs, and experiencing hangovers. (Wyatt, 2010)

Concern beyond caffeine: Marketing

According to the Marin Institute, 65% of energy drink consumers are under the age of 24 (Simon & Mosher, 2007). In a 2007 report titled, Alcohol Energy Drinks and Youth: A Dangerous Mix, the Marin Institute showed that caffeinated alcoholic drinks target youth audiences in the following ways: creating brand confusion, providing low cost alternatives to non-alcoholic versions, and utilizing grass roots "viral" marketing (Simon & Mosher, 2007). Two common underlying themes behind their marketing are taking risks and having more energy for longer partying.

Brand confusion

Many energy drinks come in colorful cans with modern graphics, fonts, and candy-like color schemes along with sweet, fruity flavors. Alcoholic energy drinks resemble their non-alcoholic energy drink counterparts using similar color schemes, fonts, container shapes, and logos. Companies like Rock Star even produced their own alcoholic version playing on brand loyalty.

Low cost alternative

Alcoholic energy drinks are often priced the same or less than non-alcoholic versions, thus making them cheaper to consume than mixing an energy drink with hard alcohol. They are also often cheaper per can - averaging between $2.50 and $3.00 - than a can or bottle of beer or a mixed drink at a bar.

Grass roots marketing and the use of social media

Several energy drink companies have student representatives who promote their drinks on college campuses. Other companies sponsor extreme sports events that are popular with teens. Still others sponsor fraternity organizations on campuses.

Cyber marketing and the use of social media is especially popular with Facebook fan pages, You Tube videos, tweets from events, and media contests. The Washington State Liquor Board found fan photos from Four Loko's and Joose's websites that included pictures of people consuming their products whose profiles indicated that they were under the age of 21. Websites for these drinks also offer music download apps and wall papers for cell phones and smart phones.

Timeline of policy engagement

Although recent attention has been focused on Four Loko, agencies at the federal, state, and local levels have been engaged with this issue for well over a year. In November 2009, at the urging of 18 state attorneys general, the U.S. Food and Drug Administration contacted several companies that produced caffeinated malt beverages (U.S. FDA, 2009). Because caffeine was never approved as an additive for any beverage other than soft drinks, the FDA requested supporting evidence that large amounts of caffeine combined with alcohol was safe. A few manufacturers voluntarily removed caffeine from their product.

In October 2010, the U.S. Federal Trade Commission sent letters to the maker of several caffeinated malt beverages because their marketing was deemed deceptive. In late October, several states banned the sale of such substances (U. S. FTC, 2010).

Finally, on November 17th 2010, the U. S. FDA issued warnings to four manufacturers notifying them that caffeine in their products is an unsafe food additive (U.S. FDA, 2010). Companies are being urged to cease production or reformulate their products or risk further action under federal law. All four companies have complied with the FDA request. And, after December, these products will no longer be available with caffeine or will no longer be produced.

What campus professionals can do

Although caffeinated malt beverages are no longer in production, there are still risks involved in mixing high levels of caffeine and alcohol. Below are some suggestions to assist campus professionals.

Educate yourself and your community members:

- send a letter to your student body, faculty, and staff explaining the health concerns
- print an article in the student newspaper
- provide up-to-date information on your website, fan pages, or twitter feeds
- create a bulletin board that can be posted in areas with heavy student traffic
- create an informational slide show for guest lectures, floor programs, or peer education groups
- conduct a social norms or social marketing campaign about alcohol and energy drinks
- send letters to local bars and point of liquor sales locations explaining your concern about these products

Utilize environmental management strategies to limit availability:

- Develop a policy to limit the promotion or use of energy drinks and or premixed alcoholic energy drinks on campus
- Research energy drink sales on campus or in your community. If your campus sells energy drinks, see if your business offices or vendors can provide evidence of heightened sales. For example, if most sales are on weekends, one might infer that these beverages are being consumed before or with alcohol.
- Work with community stakeholders such as local law enforcement, liquor commissions, or retailers to limit the availability or sales of energy drinks in the surrounding community.

Engage community leaders:

- If your state has not become involved, send letters to the Attorneys General in your state, the Departments of Public Health, or local law enforcement agencies asking for action on this issue.

The following chart contains information about caffeinated alcoholic beverages. Since the creation of this document, some of these beverages are no longer in production.

Product	Supplier	Ingredients	Alcohol Content	Container Size	Estimated Calories*	Estimated number of standard drinks**
808	Liquid Arts Beverage Group	Cognac, vodka, liquor, caffeine and guarana	10%	12 oz.	350	2
Axis	Associated Brewing Company	Artificial flavors, wormwood oil, and certified color	1 2%	16 oz.	400	3.2
BE	Anheauser-Busch Inc.	Beer, caffeine, ginseng & guarana extract	6.60%	10 oz.	250	1.1
California Organic Brewery, Mateveza	Rave Associates, Inc.	Beer with yerba mate (caffeinated tea)	5%	22 oz.	500	1.8
Carpe Noctum A.M.	Atomic Brands, Inc.	Vodka, caffeine, taurine, natural and artificial flavors	9%	12.68 oz.	350	1.9
Core	Associated Brewing Company	Artificial flavors, wormwood oil, color	12%	23.5 oz.	700	4.8
Core	Associated Brewing Company	Malt beverage with natural and artificial flavors, taurine, guarana, ginseng, caffeine	12%	23.5 oz.	700	4.8
Four Loko beverages	Phusion Projects, LLC	Malt beverage with artificial flavors, taurine, guarana, caffeine, and FD&C	12%	23.5 oz.	700	4.8
Jack Daniel's Country Cocktail, Black Jack Cola	Brown-Forman Corporation	Malt beverage with natural flavors, artificial color, and caffeine	5%	10 oz.	200	.08
Joose, Max	United Brands Company, Inc.	Malt beverage with natural flavors, ginseng, taurine, caffeine	12%	23.5 oz.	700	4.8
Joose Mamba, Joose Orange, Panther Joose	United Brands Company, Inc.	Malt beverage with natural flavors, caffeine, ginseng, taurine, and certified colors	9.90%	23.5-24oz.	700	5

**calories are reported on Daily Burn http://dailyburn.com*

***drink estimates are calculated on the NIAAA "What's in Your Cocktail Calculator" http://rethinkingdrinking.niaaa.nih.gov/ToolsResources/CocktailCalculator.asp*

Resources

California Department of Alcohol and Other Drug Programs
http://www.adp.ca.gov/youth/aed_resources.shtml
includes information and ready-to-print social marketing posters

Outside the Classroom
http://www.outsidetheclassroom.com/community/tools-resources/alcohol-and-energy-drinks.aspx
includes a comprehensive document outlining resources and action steps and a webinar “Alcoholic Energy Drinks Consumption, Risk-Taking and Consequences”

Marin Institute
https://www.marininstitute.org/site/images/stories/pdfs/energydrinkreport.pdf
a 21 page white paper on energy drinks and alcohol including history, marketing strategies, health implications, and recommendations.

Higher Education Center
http://www.higheredcenter.org/files/prevention_updates/june2010.pdf
highlights research and prevention efforts

U.S. Food and Drug Administration
http://www.fda.gov/Food/FoodIngredientsPackaging/ucm190366.htm
web page containing press releases, letters, and information about alcohol and caffeinated beverages

U.S. Centers for Disease Control and Prevention
http://www.cdc.gov/alcohol/fact-sheets/cab.htm
contains information and prevention strategies for caffeinated alcoholic beverages

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