

# Why mixing alcohol and caffeine is so deadly

22 November 2010, By Linda Shrieves

Americans love their caffeine - in coffee, colas and now in their alcohol.

But mixed together, particularly in high volumes, the combination of [caffeine](#) and alcohol can be deadly.

That's why toxicologists and doctors are encouraged to see the U.S. Food and Drug Administration crack down on the makers of drinks such as Four Loko and Joose, which experts compare to two cups of coffee combined with the equivalent of four or five beers.

Why caffeine and alcohol are so toxic together isn't fully understood, but the combination appears to impair a drinker's judgment more than [drinking alcohol](#) alone. That has led to what some researchers call "toxic jock syndrome."

"Amongst some users, there's a higher incidence of risk-taking behaviors because their perceptions of their limitations are distorted," said Dr. Steven Lipshultz, chief of pediatrics at the University of Miami medical school.

As a stimulant, caffeine jazzes up your whole body, increasing blood pressure, heart rate and in some cases, causing [heart palpitations](#) and an [irregular heartbeat](#). Caffeine also leads to headaches, jitteriness, agitation, stomach problems and abnormal breathing. It's the equivalent of an adrenaline rush, said Lipshultz.

Alcohol, on the other hand, is a depressant that slows down the brain's functioning and impairs one's ability to walk, talk and think clearly.

Mixed together, the stimulant and the depressant do not cancel each other out.

"Some people have the idea that the caffeine will negate the effect of the alcohol - and that's simply not true," said Dr. Glenn Whelan, assistant

professor at the University of South Florida College of Pharmacy.

Instead, the caffeine appears to override the natural [sleepiness](#) that occurs when someone drinks alcohol. It also delays the feeling of drunkenness, so those who drink an alcoholic energy drink are likely to keep drinking beyond their normal limits.

How dangerous is one can of an alcoholic energy drink? Many brands in this burgeoning beverage field are packaged in 23.5-ounce cans that contain 260 milligrams of caffeine and are 12 percent alcohol by volume.

The effect on a drinker depends on a person's body weight, but teens and college students - many of whom are more slender than older drinkers and haven't developed a tolerance to alcohol - are far more likely to be affected by just one can, experts say.

"One can of Four Loko in a small, young woman can produce a blood alcohol level of .15 - that's almost twice the legal limit," said Dr. Bruce Goldberger, a professor of toxicology at the University of Florida. "In some individuals, that could be life-threatening - or lead to a life-threatening event."

Even those who can tolerate a single can will probably drink it in a short period of time. And that, says Whelan, is why Four Loko is known as "blackout in a can."

"If you drink a 24-ounce can of Four Loko in one hour, that's almost like drinking a full six-pack of beer in an hour," Whelan said. "But you have that caffeine making you more alert, so you keep drinking. It's like the worst of the worst things you can do."

Scientists aren't sure exactly how the body

processes the combination of caffeine and alcohol because the combination - at least in the quantity seen in these alcoholic [energy drinks](#) - is too dangerous to test on humans in scientific experiments.

"There have been no studies approved because of the lack of safety," said Goldberger at the University of Florida. "There are no studies that address physiological changes when someone drinks an alcoholic energy drink."

However, in 2008, University of Florida researchers conducted a study in which they interviewed college-aged adults leaving bars. They found that bar patrons who reported drinking alcohol mixed with energy drinks - 6.5 percent of study participants - were three times more likely to be intoxicated than drinkers who consumed alcohol only.

The average breath-alcohol concentration reading for those who mixed alcohol and energy drinks was 0.109, well above the legal driving limit of 0.08. Consumers of energy drink cocktails also left bars later at night, drank for longer periods of time, ingested more grams of ethanol and were four times more likely to express an intention to drive within the hour than patrons who drank alcohol only.

Now that the FDA is cracking down on alcoholic energy drinks, some wonder if they will only be replaced by cocktails of Red Bull and vodka or Jagerbombs, a shot of Jagermeister liqueur dropped into a glass of Red Bull. But those, said Goldberger, aren't nearly as strong as a Four Loko or a Core Spiked.

One 8.3 ounce can of Red Bull contains 80 milligrams of caffeine. By contrast, a 12-ounce serving of Coke contains 34 milligrams of caffeine. Four Loko contains about 260 milligrams of caffeine in each can.

"Comparing them is like comparing apples to oranges because the alcohol content of a Red Bull plus vodka is only about one-fourth or one-fifth of what is found in a Four Loko," Goldberger said. "And Red Bull doesn't really contain that much

caffeine. You'd have to drink three Red Bulls to get the same caffeine you'd find in an alcoholic energy drink. There's a big difference."

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## ROGUES GALLERY OF ALCOHOLIC ENERGY DRINKS

The crackdown on alcoholic energy drinks isn't limited to Four Loko. The U.S. [Food and Drug Administration](#) and Federal Trade Commission have targeted these drink makers:

United Brands Co., which sells Joose and Max caffeinated alcohol beverages. The carbonated malt beverages come in fruity flavors, and one 23.5-ounce can of Joose or Max has about the same alcohol content as four regular or five light beers.

Phusion Products LLC, which sells Four Loko and Four Maxed carbonated malt beverages offered in fruity flavors. Four Loko is sold in 23.5-ounce cans, which have the same alcohol content as four regular or five light beers, as well as added caffeine, taurine and guarana. Four Maxed is sold in 16-ounce cans, which have the same alcohol content as about three regular beers and contain added caffeine.

Charge Beverages Corporation, which sells Core High Gravity, Core Spiked and El Jefe carbonated malt beverages sold in fruit flavors, with added caffeine, taurine, guarana, and ginseng. One 23.5-ounce can of Core High Gravity or Core Spiked contains the same alcohol content as four regular or five light beers. A 32-ounce can of grape-flavored El Jefe has the same alcohol content as six regular or seven light beers.

New Century Brewing Company, which sells the caffeinated malt alcohol beverage Moonshot. A 12-ounce bottle of Moonshot contains 5 percent [alcohol](#) by volume.

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