

September 21, 2009

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Re: The Use of Caffeine in Alcoholic Beverages

Dear Generals Blumenthal, Shurtleff, and Limtiaco,

This letter is written in response to the concerns raised by State law enforcement officials regarding the safety of caffeinated alcoholic beverages. Collectively, we have studied and conducted research in this area, and based on our findings and our comprehensive review of the scientific literature on this topic, we conclude that there is no evidence to support the claim that caffeine is "generally recognized as safe" ("GRAS") for use in alcoholic beverages.

Caffeine is the most widely consumed central nervous system stimulant in the world. It is present naturally in the beans, leaves, and fruit of certain plants, including coffee, tea, cacao, kola, guarana, and yerba mate. Caffeine-containing foods or beverages are consumed regularly by approximately 90% of the United States population, including children (Frary, Johnson, & Wang, 2005).

The combined use of caffeine and alcohol is increasing, with the reported prevalence among U.S. college students as high as 28% (Miller, 2008a; O'Brien et al., 2008; Malinauskas et al., 2007). Alcohol mixed with caffeine poses serious public health risks for several reasons. First, frequent consumers of caffeinated energy drinks drink greater quantities of alcohol than individuals who do not drink caffeinated energy drinks (Miller, 2008a; Oteri et al., 2007; Arria et al., in press). In fact, the consumption of caffeinated alcoholic beverages by college students is associated with significantly increased heavy episodic drinking and episodes of weekly drunkenness (O'Brien et al., 2008). Persons who consume caffeinated alcoholic beverages are much more likely to have alcohol-related problems (Miller, 2008b; O'Brien et al., 2008). This is a significant public health concern because many studies have shown that increased exposure to alcohol during the developmental periods of adolescence and young adulthood will increase the risk for alcohol dependence later in life (e.g., see Clark, Kirisci, & Tarter, 1998; Grant & Dawson, 1997). Moreover, there is emerging evidence that increased exposure to psychoactive drugs in general (including alcohol and caffeine) is associated with an increase in the risk for later drug dependence.

Second, although a person's subjective perception of alcohol intoxication (i.e., "feeling drunk") may be reduced by the ingestion of caffeine, the impairments to judgment and reaction time associated

with drunkenness are not (Ferreira et al., 2006; Marczynski & Fillmore, 2006). The advertising of caffeinated alcoholic beverages often suggests that they are “stimulating,” fueling the popular, but incorrect, notion that drunkenness may be ameliorated or altogether averted by mixing caffeine with alcohol, even when the amount of ingested alcohol is extreme. This particular consequence is a health and safety concern for many reasons. Being able to accurately perceive one’s level of intoxication is important; an inaccurate perception will, for example, increase the likelihood of driving while intoxicated or alcohol poisoning, or inflicting injury to oneself or another person. Expectancies regarding the palliative effects of caffeine may further exacerbate these risks by undermining compensatory adaptive responses to alcohol-induced impairment (Fillmore, Roach, & Rice, 2002).

In addition, being wide awake and drunk at the same time increases the risk of engaging in several forms of violent or other high-risk physical behaviors that can cause injury. Even after adjusting for the amount of alcohol consumed, college students who consumed alcohol mixed with energy drinks had a significantly higher prevalence of serious alcohol-related consequences such as being taken advantage of sexually, taking advantage of someone else sexually, riding with a drunken driver, and being physically injured, compared to students who drank alcohol alone (O’Brien et al., 2008).

Experimental studies conducted to date have not established the safety of co-ingestion of caffeine with high levels of alcohol. Experimental studies that have investigated the effects of co-ingestion of alcohol and caffeine have unanimously set the upper limit on the blood alcohol level achieved during the experiment to be the legal limit of 0.08 g/dL. Moreover, the amount of caffeine consumed in these experiments is moderate so as not to raise the risk of unintended cardiovascular and neurological consequences.¹ The methodological limitations of these studies make extrapolation of the findings very difficult. In natural settings (e.g., bars, homes, etc.), young adults who drink alcoholic energy drinks routinely drink to excessive amounts where the legal limit of BAC is exceeded² while simultaneously consuming high levels of caffeine.

Finally, to our knowledge, only one recently published study investigated the possible arrhythmogenic effects associated with combining alcohol and caffeinated energy drinks (Wiklund et al., 2009). Their findings suggested that the risk of arrhythmias could be accentuated with the combined intake of energy drinks and alcohol, especially in predisposed individuals.

In light of the foregoing health and safety issues, there has been growing international concern regarding the consumption of alcoholic energy drinks. The European Centre for Monitoring Alcohol Marketing (EUCAM), the Dutch National Foundation for Alcohol Prevention (STAP), the Food Safety Promotion Board of the Republic of Ireland (SafeFood), Educ’alcool of Quebec, the French Minister of Health, and the governments of Australia and New Zealand have all issued warning statements about the physiological and safety risks associated with combining alcoholic beverages and energy drinks.

¹ Regardless of the methodological limitations of experimental studies to extrapolate to “real world” settings, their findings have been mixed and generally inconclusive. Of the thirteen experimental studies we reviewed, two showed evidence that co-ingesting low doses of alcohol with caffeine in a laboratory setting was associated with impaired neuropsychological performance, three showed that caffeine can slightly reduce alcohol-related psychomotor impairment, three showed no significant effects, and five showed mixed results. The conflicting findings most likely stem from variation in the types of performance tests used as outcomes, timing of dose administration, individual variability in alcohol-tolerance and caffeine-sensitivity, and as pointed out by Fillmore et al. (2002), individual expectancies.

² Our own recent work has documented that 65% of college students reached the level of getting drunk at least half the times they drank in the past month (Arria et al., in preparation).

In summary, there is no general consensus among health professionals and the scientific research community that the use of caffeine in alcoholic beverages has been demonstrated to be safe. On the contrary, the consumption of caffeinated alcoholic beverages has been associated with increased risk of serious injury to oneself and to others, as the result of driving while intoxicated, sexual assault, and other dangerous behaviors.

Sincerely,

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Relevant Reviews of Literature (see attached pdf file)

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Additional Experimental Studies Reviewed (pdf file available upon request)

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