

Ephedra and Energy Drinks on College Campuses

by Daniel Ari Kapner

The February 2003 death of Baltimore Orioles pitcher Steve Bechler, who according to the coroner's report died after taking ephedrine alkaloids (ephedra), has garnered national attention for the topic of nutritional supplements and energy drinks.¹ While the headlines have focused mainly on use by professional athletes, these substances have gained popularity among college-age students and are associated with the deaths of Florida State University linebacker Devaughn Darling, Northwestern University football player Rashid Wheeler, and the University at Albany, SUNY, football player Peter Schlendorf.^{1, 2, 3}

Energy drinks and energy-enhancing pills, diet aids, muscle-enlargers, and other supplements fall under the 1994 Dietary Supplement Health and Education Act, which states that products deriving from herbs and natural sources are classified as food, rather than as drugs.⁴ These legal substances, which produce appealing, steroid-like effects, are marketed heavily to college-age athletes, club-goers, dancers, and partyers. The energy drink and herbal industry's vast marketing presence has created an environment where students understand little about these products' adverse effects.^{4, 5}

This *Infofacts/Resources* describes the use of ephedra and energy drinks on college campuses, possible effects of their use, and recommendations for institutions of higher education.

For additional information

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EPHEDRA

The U.S. Food and Drug Administration (FDA) banned ephedra as an energy enhancer and diet aid in April 2004. Before being banned, ephedra was marketed largely to college athletes to increase "strength, dynamic power, energy . . . endurance levels . . . alertness and perception."^{6,7} Also known as ma huang, ephedra is considered a "natural" supplement⁷ and Chinese herbalists have used the herb Ephedra for thousands of years to treat asthma and colds.⁸ Ephedra has been used in some over-the-counter cold and asthma products in the United States.⁹

Until recently, ephedra was found in many weight-loss and energy-enhancing products. Popular supplements that contained ephedra included Metabolife and Ripped Fuel, both of which are now available in ephedra-free formulations. As recently as 2003, one Internet bodybuilding retail site listed 42 products that included ephedra.⁶ Ephedra was the primary ingredient in herbal ecstasy, commonly sold on the Internet.¹⁰

Herbal companies often misinform consumers about the actual ingredients and dosages in their products.¹⁰ Incorrect labeling may be more widespread than consumers realize. For instance, the American Council on Science and Health (ACSH) reported that one product, "wild Chinese ginseng," lists ginseng as its only ingredient, yet ACSH laboratories also found caffeine and 45 milligrams of ephedra in each tablet.¹⁰

Adverse Effects of Ephedra

Ephedra can induce headaches, insomnia, tremors, nerve damage, rapid or irregular heartbeat, high blood pressure, hypertension, strokes, heart attacks, seizures, brain damage, and death.^{11,12} The FDA received more than 1,500 reports of adverse reactions from ephedra prior to September 2001.¹³

According to a RAND Corporation 2003 study of adverse reactions, ephedra was linked to five deaths, five heart attacks, 11 strokes, four seizures, and eight psychiatric events in those cases where records were complete and no other contributing factors were found. Half of the events in which ephedra was the main contributing factor affected apparently healthy people under age 30.¹³

The *Annals of Internal Medicine* published a study in 2003 suggesting that ephedra accounted for 64 percent of all adverse reactions from herbal products in 2001, even though it represented only 4.3 percent of industry sales in that year.^{14,15}

A study published in the *New England Journal of Medicine* in 2000 examined 140 cases of ephedra-related health incidents. They concluded that 43 cases (almost 31 percent) were "definitely" or "probably" ephedra-related; in these cases, three people died, seven became permanently disabled, and four required continuing medical treatment. Another 44 cases were "possibly" related to ephedra-containing products.^{5,12}

Regulating Ephedra

After Baltimore Orioles pitcher Steve Bechler died, the FDA ordered herbal companies to print warning labels on ephedra-containing products.¹⁶ The FDA first proposed limits on ephedra in 1997 due to reports of negative health effects, which began a years-long process ultimately resulting in the 2004 FDA rule to prohibit the sale of ephedra. Unlike medications, which pharmaceutical companies must prove safe and efficacious before marketing, ephedra was protected under the 1994 Dietary Supplement Health and Education Act (DSHEA) as a food rather than a drug. This classification meant that to ban the substance, the FDA had to bear the burden of proving that ephedra presents "an unreasonable risk to those who use it."¹⁷

In December 2003, the FDA announced that it would ban the sale of all dietary supplements containing ephedra, effective April 12, 2004. At the time of the announcement, the FDA warned 62 companies that make or sell ephedra-containing supplements to stop manufacturing and marketing the products as soon as possible. This landmark ruling was the first time since the DSHEA was passed that the FDA had taken action to outlaw the sale of a supplement.

The FDA ruling states that use of ephedra supplements has little positive effect aside from short-term weight loss.¹⁷ Tommy G. Thompson, Secretary of Health and Human Services, declared that supplements



containing ephedra “pose unacceptable health risks, and any consumers who are still using them should stop immediately.”¹⁸ Moreover, referring to research by the National Institutes of Health, the FDA reported that ephedra is associated with heart palpitations, psychiatric effects, tremors, insomnia, and upper gastrointestinal effects, especially when use is combined with caffeine or other stimulants.¹⁷

If manufacturers continue to market ephedra-containing supplements, the FDA can prohibit the products from being sold or take action to remove the supplements from the market. Some ephedra-containing products are not affected by the ban, including traditional Chinese herbal medicines, herbal teas, and medications that contain chemically synthesized ephedra as an ingredient.¹⁷

Even before the FDA’s ban on sales of ephedra supplements, three states had banned ephedra dietary supplements. Illinois passed legislation in May 2003, following the death of a 16-year old football player who had a heart attack and died after using ephedra.¹⁹ New York became the second state to ban ephedra, passing a bill in June 2003.²⁰ The California State Senate approved a ban in May 2003.²¹ The Massachusetts state legislature had proposed a ban.²²

Prior to the FDA ban, sports organizations realized the adverse effects of ephedra. The National Collegiate Athletic Association (NCAA), the International Olympic Committee, and NASCAR banned the use of ephedra by competitors prior to its nationwide ban.^{23,24} In October 2001, the National Football League became the first professional athletics organization to ban it, following the death of Corey Stringer from the Minnesota Vikings.²⁵ Major League Baseball, the National Hockey League, and the National Basketball Association warned against using ephedra; none of these organizations had banned it or tested for drug use.²⁶ In an investigation of ephedra-containing supplements, the U.S. House of Representatives Energy and Commerce Committee wrote to major professional sports leagues in spring 2003 requesting information about their policies concerning the use of ephedra by athletes in their leagues.²⁷

Ephedra and Students

According to an NCAA survey of more than 500 campus athletics programs, only 48.7 percent test their student athletes for drugs, and fewer than half of these programs test for ephedra.²⁸

A national survey by the NCAA suggests that ephedra users have risen from nearly zero percent of college athletes in 1993 to almost 4 percent in 2001, compared

with the general population’s user rate of 1 percent.^{29,30} Among women’s sports, ice hockey has the highest rate of ephedra use, at nearly 12 percent.

Most disturbing is the upsurge in use among female gymnasts, from 1 percent in 1997 to 8 percent in 2001. Lacrosse has the most male ephedra users, with a rate of almost 6 percent.²⁹ It is still too soon to tell what effect the FDA ban on the sale of ephedra supplements will have on students’ use.

Performance enhancement substances are marketed heavily on college and university campuses. Met-Rx, a company that no longer sells ephedra but uses an “ephedra copycat,” has sponsorship agreements with 18 colleges or universities. Some of these agreements exceed six figures and include stadium advertising and distribution of free samples of products.³¹ Another supplement maker, Experimental and Applied Science (EAS), which was one of the country’s leading ephedra-makers, held a three-year contract (that expired in spring 2003) as title sponsor for the Mountain West Conference postseason basketball tournament. EAS had its logo on the court, at the scorer’s table, and on the players’ chairs, and the tournament aired EAS commercials on national television. EAS still manufactures products banned by the NCAA.³²

ENERGY DRINKS

Energy drinks are beverages loaded with caffeine, sugar, and other ingredients such as ginseng, taurine, guarana, and B-complex vitamins.^{33,34} Before the FDA ban, energy drinks very popular on campus, such as Extreme Ripped Force, 4m energizer, and Xtreme NRG, contained ephedra.^{35,36} Extreme Ripped Force contained 25 milligrams of ephedra, more than three times the limit the FDA recommended in 1997.^{33,34} One energy drink, Hansen Beverage Company’s Hard E, contains 5 percent alcohol.³⁷ With the recent FDA ruling banning ephedra in supplements, many of the manufacturers of ephedra-containing energy drinks introduced ephedra-free alternatives.³³

Energy drinks are marketed to students, athletes, and active individuals between the ages of 21 and 35. Often taken after exercise or mixed with vodka, energy drinks are promoted at nightclubs, bars, universities, concerts, and other events that attract students.^{9,38} One energy drink, Amp, held promotions at nearly 30 university events in Boston during the fall of 2001.³⁹ These beverages advertise a wide range of unverified, yet appealing effects. For

example, Red Bull, another energy drink, publicizes increased “physical endurance . . . reaction speed and concentration . . . mental alertness (stay awake) . . . overall feeling of well-being . . . metabolism [and] stamina.”⁴⁰

A 2001 survey of 1,081 college students found that 22 percent reported using energy drinks.⁴¹ The beverage industry views energy drinks as a growth market. Red Bull, originating in Austria, controls nearly two-thirds of the energy drink market in the United States, earning \$300 million in 2002 and \$1.2 billion worldwide.⁴² The number of energy drink companies is growing. Other brands include 180, Adrenaline Rush, Atomic Energy, Blue Ox, Dark Dog, Energy Bomb, Hansen’s Hard E, Jones’ Whoop Ass, KMX, Niagra, Power House, SoBe, and Virgin Hi Energy. Major corporations such as Pepsico, Coca-Cola, Anheuser Busch, and Cadbury Schweppes all produce their own energy drinks.

Adverse Effects

Energy drinks can become dangerous when taken after exercise or mixed with alcohol.^{9,43} Adverse effects include dehydration, insomnia, headaches, nervousness, nosebleeds, and vomiting. Reports claim that energy drinks have caused even more severe reactions, such as seizure, heart arrhythmia, and death.^{9,44} The stimulating effect of energy drinks is deceiving, causing people to feel less intoxicated than they actually are and making it harder for bartenders to determine whether their patrons should no longer be served. As a result, people may be more inclined to drive while impaired.⁴⁵

Suspected deaths linked to energy drinks have been reported in Australia and Ireland.^{45,46} Three people died in Sweden after drinking Red Bull: two had mixed Red Bull with alcohol, and the third drank it after an exercise session. There is debate regarding whether the drinks caused these deaths, but as a result, some restaurants in Sweden have banned Red Bull in their establishments.⁴⁷ The Swedish National Food Administration recommended that Red Bull not be mixed with alcohol or consumed after exercise.⁴⁴ Norway sells Red Bull only in pharmacies because of its high level of caffeine.⁴⁵ Due to health experts’ recommendations, France and Denmark have banned Red Bull altogether. In 2004, the European Union as a whole will begin requiring Red Bull and other energy drinks to carry a health warning about their “high caffeine content.”⁴⁸

STRATEGIES FOR INSTITUTIONS OF HIGHER EDUCATION

The increase in use of ephedra and energy drinks calls for institutions of higher education to include these substances in their alcohol and other drug prevention efforts. Environmental management strategies⁴⁹ for reducing their use include the following:

Creating a Social, Academic, and Residential Environment That Promotes Healthy Social Norms

- Survey students to determine the prevalence of ephedra use and energy drink consumption on campus.
- Develop social norms marketing campaigns⁵⁰ to address any exaggerated misperceptions of ephedra and energy drinks.
- Educate students and athletes about the potential risks of taking ephedra-containing products or consuming energy drinks after exercise or mixed with alcohol. Students should not only read warning labels but also know what ingredients are potentially dangerous and should be avoided.

Limiting Availability and Access

- Utilize campus and community coalitions, including law enforcement agencies, to prohibit the sale of such products on campuses.
- Work with local bars and nightclubs to discourage mixing energy drinks with alcohol.
- If bars and nightclubs continue to mix energy drinks with alcohol, encourage them to limit the amount of drinks per patron.

Restricting Marketing and Promotion

- Prohibit on-campus advertising of energy drinks or ephedra-containing herbal supplements.
- Reduce marketing and promotion targeted at athletes. Work with local bar owners to limit such marketing.
- Work with campus and community coalitions to restrict promotions in the community that advertise these products.
- Work with law enforcement to address and investigate promotions found on campus and in the surrounding community.

Enforcing Campus Policy and State and Local Laws

- Revise campus alcohol and other drug policies as necessary to include ephedra. Ban the use of energy drinks during athletics competition and training.
- Create and enforce policies that limit team participation for alcohol and other drug use.
- Communicate campus alcohol and other drug policies clearly and frequently to the community, including possible consequences for violations.

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The Higher Education Center for Alcohol and Other Drug Prevention

The U.S. Department of Education's Higher Education Center for Alcohol and Other Drug Prevention assists institutions of higher education nationwide in developing, implementing, and evaluating alcohol, other drug, and violence prevention policies and programs that will foster students' academic and social development and promote campus and community safety. The Center provides training; technical assistance; assessment, evaluation, and analysis activities; publications; and support for The Network: Addressing Collegiate Alcohol and Other Drug Issues. (See page 1 for the Center's contact information.)

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The National Collegiate Athletic Association (NCAA) sponsors CHAMPS/Life Skills, a comprehensive educational program for college athletes that addresses a number of issues, including alcohol and other substance use. To participate in the CHAMPS/Life Skills program, colleges must apply to the NCAA to enroll. Once enrolled in the program, colleges receive workshop materials, training, and technical assistance. The organization also sponsors Athletic Prevention Programming and Leadership Education

(APPLE) conferences for coaches, trainers, students, and health educators, working in conjunction with the University of Virginia's Institute for Substance Abuse Studies. NCAA awards grants to support substance abuse prevention programs targeting college athletes.

The Network: Addressing Collegiate Alcohol and Other Drug Issues

c/o The Higher Education Center for Alcohol and Other Drug Prevention
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The Network (formerly known as the Network of Colleges and Universities Committed to the Elimination of Drug and Alcohol Abuse) is a national consortium of colleges and universities formed to promote healthy campus environments by addressing the issues of alcohol, other drugs, and violence. Begun in 1987 by the U.S. Department of Education, The Network comprises member institutions that voluntarily agree to adhere to a set of standards aimed at reducing AOD problems at colleges and universities. It has close to 1,500 members nationwide. The Network develops collaborative alcohol and other drug prevention efforts among colleges and universities through electronic information exchange, printed materials, and sponsorship of national, regional, and state activities and conferences.

U.S. Food and Drug Administration

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