POSITION STATEMENT AND RECOMMENDATIONS FOR THE USE OF ENERGY DRINKS BY YOUNG ATHLETES

National Federation of State High School Associations (NFHS)
Sports Medicine Advisory Committee (SMAC)

Background: Energy drinks are popular among adolescents and young adults and are the second most popular dietary supplement after multivitamins. The distinction between energy drinks and sports drinks is important. Energy drinks are drinks that contain stimulants and claim to "provide energy" while sports drinks contain electrolytes and sugar meant to rehydrate athletes after a workout. Energy drinks are marketed as a quick and easy way to maximize physical performance and mental alertness.

In addition to the regular-sized energy drinks, energy shots are a concentrated form of the same formulation containing caffeine, sugar and other substances. A notable study found that the number of people who visited an Emergency Room with energy drink-related complications doubled between 2007 and 2011, and that 10 percent required hospitalization. Despite efforts to educate consumers, a survey done in 2018 found that 40% of American teens had consumed an energy drink within the previous three months.

Energy drinks can contain up to 500 mg of caffeine, which is five times as much as a typical cup of coffee and 10 times as much as found in a 12-ounce soda. The effects of this can lead to abnormal heart rhythms and even death. After a period of increased alertness, symptoms of caffeine withdrawal predominate. The drinks also contain large quantities of sugar, which causes a spike in blood sugar levels that may be followed by a "sugar crash" with fatigue, shakiness and anxiety. The marketing of these beverages is targeted toward adolescents and young adults. Despite the decrease in the consumption of soft drinks, the sales of energy drinks continue to rise, increasing 47% from 2016 to 2021.

The NFHS SMAC strongly recommends that:

1. Water and appropriate sports drinks should be used for rehydration as outlined in the NFHS "**Position Statement and Recommendations for Maintaining Hydration to Optimize Performance and Minimize the Risk for Exertional Heat Illness**."
2. Energy drinks SHOULD NOT be used for hydration prior to, during or after physical activity.
3. Information about the absence of benefit and the presence of potential risk associated with energy drinks should be widely shared among all individuals who interact with young athletes.
4. Energy drinks ARE NOT sports drinks and should not be used by athletes in training or competition.
5. Athletes taking over-the-counter or prescription medications are at increased risk for significant, potentially fatal complications, so they should not consume energy drinks without the approval of their physician.

WARNING: Energy drinks are not classified as dietary supplements or beverages. At this time, all of these drinks are completely unregulated. Therefore, the inclusion of different ingredients, their concentrations and their purity is unregulated. There is a significant risk for negative side effects (see below), potentially harmful interactions with prescription medications [particularly stimulant medications used to treat Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD)], or positive drug tests due to contaminants containing banned substances.

Frequently Asked Questions

What is an energy drink?

- An energy drink is a beverage marketed as a quick and easy means of relieving fatigue and improving performance. All energy drinks contain carbohydrates (sugar) and caffeine as their main ingredients. The carbohydrates provide nutrient energy while the caffeine acts as a stimulant to the central nervous system. These drinks may include a variety of other ingredients such as taurine (an amino acid), B vitamins and herbal extracts.

What are the differences between an energy drink and a sports drink?

- Sports drinks are marketed to replenish electrolytes such as calcium, magnesium, sodium and potassium. These electrolytes are typically eliminated from the body during the process of sweating, leaving athletes dehydrated and susceptible to exertional cramping and heat illness. Sports drinks replace these electrolytes along with water, which rehydrates, and sugars, which are added to make the drinks more palatable. Most sports drinks contain a 6 to 8% carbohydrate solution and a mixture of electrolytes. The carbohydrate and electrolyte concentrations are formulated to allow maximal absorption of the fluid by the gastrointestinal tract. Energy drinks often contain a higher concentration of carbohydrates (usually 8 to 11%) and thus, a greater number of calories than sports drinks. They also contain high amounts of caffeine and, in some cases, other nutritional supplements. Additional ingredients with caffeine-like effects may be present, yet typically their caffeine content is not noted. **Energy drinks are not appropriate for hydrating or re-hydrating athletes during physical activity and should not be used in such circumstances**.

What ingredients are found in energy drinks?

- *Sugars/Carbohydrates*- Energy drinks are typically high in sugar. For example, a Monster Energy Drink has 54 grams of sugar, which is equal to 13.5 teaspoons. Other popular brands contain up to 21 teaspoons of sugar. The consequences of such high levels of sugar include weight gain and obesity, type 2 diabetes, dental decay and erosion, aggression and anxiety. The high carbohydrate concentration can also delay gastric emptying and impede absorption of fluid from the gastrointestinal tract.
- *Caffeine*- Nearly all energy drinks contain some quantity of caffeine. The caffeine concentration may range from the equivalent to an 8-ounce cup of coffee (90 mg) to more than three times that amount. The American Academy of Pediatrics (AAP) offers a guideline of no more than 100 mg of caffeine per day in adolescents; however, many of these drinks far surpass that. For example, a 16-ounce can of Monster Energy contains 160 mg of caffeine, while the Rockstar Energy Drink Original contains 160 mg of caffeine per 16-ounce can, and the Rockstar Punched energy drink contains 240 mg of caffeine per 16-ounce can.

- *Herbs*- Many energy drinks include herbal forms of stimulants such as guarana, yohimbe, bitter orange, kola nuts, green tea extract and Yerba mate leaves, in addition to synthetic caffeine. The "performance-enhancing" effects, safety and health benefits of herbs have not been established by scientific studies and these claims are unfounded.
- *Vitamins*- The top five most common ingredients in energy drinks includes the B vitamins, which play a role in converting sugars, fats and protein into energy. Athletes with balanced diets should be assured that they are at low risk for vitamin deficiency and typically do not need supplementation. Furthermore, there is no evidence to suggest that vitamin supplementation improves athletic performance. However, drinks can contain up to 8,000% of the recommended daily value of the B vitamins and unfortunately, most of it is excreted in the urine.
- *Proteins and amino acids*- Proteins and amino acids (the building blocks of protein), such as taurine, were added to the energy drinks as a way to boost sales. Carbohydrates are utilized as the primary fuel source and only a small amount of protein is used as fuel for exercise. To date, there is no definitive evidence that amino acid or protein supplementation enhances athletic performance, especially in young, healthy athletes.
- *Other ingredients*- With the hundreds of energy drink brands that are available, the potential ingredients which they may contain are virtually unlimited. Possible additions include pyruvate, creatine, carnitine, medium-chain triglycerides and even oxygen.
- An emerging practice among young people is to mix energy drinks with alcoholic beverages. This is specifically concerning for the potential abuse of alcohol and the resultant higher amounts of alcohol consumption. The stimulant effect of the caffeine in energy drinks masks the depressant effects of alcohol offering a false sense of security, keeping drinkers awake so they can consume even more alcohol, and they end up more impaired than they realize. This leads to elevated rates of binge drinking, impaired driving, risky sexual behavior, and an increased risk of alcohol dependence. In the short term, consumption of the combination places people at risk for alcohol poisoning, and drinkers may experience abnormal heart rhythms, hallucinations, seizures and death.

What are the possible negative effects of using energy drinks?

- *Central nervous system*- Caffeine often has the effect of making a person feel "energized." Studies have shown some performance-enhancing benefits from caffeine at doses of 6 mg/kg of body weight. However, these and higher doses of caffeine may produce light headedness, tremors, impaired sleep, suppression of appetite, and difficulty with fine motor control. These effects become more pronounced at higher doses.
- *Gastrointestinal system*- The high concentrations of carbohydrates often found in energy drinks may delay gastric emptying, resulting in a feeling of being bloated. Abdominal cramping may also occur. Both carbohydrates and caffeine in the high concentrations found in most energy drinks may cause diarrhea.
- *Dehydration*- Energy drinks should not be used for prehydration or rehydration. The high carbohydrate concentration can delay gastric emptying and slow absorption from the gastrointestinal tract, and may cause diarrhea. Caffeine can act as a diuretic and, therefore, may result in increased fluid loss.
- *Positive drug tests*- Like all nutritional supplements, there is little or no regulatory oversight of energy drinks. The purity of the products cannot be ensured, and it is possible that they may contain substances banned by some sports organizations. Furthermore, the structure of some of the ingredients found in energy drinks are similar to banned drugs and can lead to a positive drug test result. Energy drinks can cause positive results for THC (the active ingredient in marijuana), barbiturates and cocaine.

- Consumption of energy drinks by adolescents and young adults has been linked to heart arrhythmia (irregular and/or rapid heart rate), other cardiovascular events such as high blood pressure and heart attacks, and liver problems.

Summary of Recommendations from Various Organizations:

- Sales of certain energy drinks have been banned in Denmark, Turkey, Uruguay, Germany and Austria. Some states in the United States have introduced legislation to restrict sales of energy drinks to adolescents and children. Recently, health-care providers have voiced increasing concerns about the consumption of energy drinks in association with alcohol because of the interaction of the stimulant effects of energy drinks and the depressant effects of alcohol.
- **American Academy of Pediatrics (AAP):** Has published a position statement condemning the use of energy drinks by youths. Children and adolescents should never consume energy drinks.
- **American Medical Association (AMA):** Ban marketing of energy drinks to children and teens.
- **American College of Sports Medicine (ACSM):** Marketing and sales to individuals younger than 18-years old should not occur. Energy drink education should be a priority in school-based curricula related to nutrition, health, and wellness.
- **American Beverage Association (ABA)**: Energy drinks should be marketed as separate from sports drinks. Energy drinks are not to be sold nor marketed in schools.

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