Policy Recommendations to Address Energy Drink Marketing and Consumption by Vulnerable Populations in the United States

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THIS COMMENTARY DEFINES ENERGY DRINK PRODucts, describes the marketing strategies used to promote these products, and explores the potential safety, health risks, and prevalence related to their use. It also discusses actions taken by government and other stakeholders to address energy drink marketing to vulnerable populations in the United States, and explores US progress to implement recommended actions between 2009 and 2019. Vulnerable populations are defined as individuals or groups who are at higher risk of dietary and health disparities due to economic disadvantage, age, gender, race or ethnicity, cultural identity, or common risk behaviors.

Although there have been numerous reviews and commentaries published on this topic, this article examines the US marketing and regulatory context based on recent evidence regarding energy drink product marketing practices and consumption. Energy drink products are currently legal substances that can be purchased in the US marketplace without age restrictions. However, there is a need to balance individual autonomy and commercial interests with regulatory oversight to protect vulnerable populations. This article concludes with suggested policy recommendations for registered dietitian nutritionists (RDNs) who may need to address energy drink marketing to young people who are especially vulnerable to the adverse dietary and health effects of these products.

Energy drinks are nonalcoholic functional beverage products or dietary supplements sold in various quantities that may contain added sugars (eg, glucose or inositol), caffeine, and other stimulants (eg, guarana), amino acids (eg, taurine or L-carnitine), botanicals (eg, ginseng), vitamins (eg, B and C), minerals (eg, calcium and magnesium), and electrolytes (eg, sodium and potassium).[1-3] Energy shots are concentrated dietary supplements sold in 2- or 3-oz bottles or cans that contain high doses of caffeine ranging from 200 to 500 mg per container.[1,3] Energy drinks, energy shots, and energy drink mixers (hereafter called energy drinks) are marketed to Americans to increase physical strength, mental alertness, and endurance.[1-4]

The US market for energy drinks was $11 billion dollars in 2018,[5] and the global market for these products may reach $83.4 billion dollars by 2024.[4,5] The Table summarizes examples of top-selling energy drink brands, ingredients, and major US manufacturers in 2018.

The caffeine in energy drinks may enhance athletes' endurance and physical performance.[6] However, concerns have been raised about the safety and health risks of energy drinks consumed by children, adolescents, and young adults who may be sensitive to excessive caffeine and other ingredients when used frequently. Between 2013 and 2019, a US Senate Commerce Committee,[7,8] public health practitioners,[9-12] professional societies,[13-15] and advocacy organizations[16] recommended that energy drink manufacturers not market to children and adolescents up to 18 years; that the Food and Drug Administration (FDA) define energy drink products as beverages that require caffeine labeling disclosures; that US regulatory agencies investigate energy drink marketing targeted to children and adolescents; and that the public should be educated about the potential side effects of energy drinks.

INTEGRATED MARKETING COMMUNICATIONS USED TO PROMOTE ENERGY DRINKS TO YOUNG PEOPLE

Similar to many food and beverage products, energy drink brands are marketed to US children, adolescents, and young adults through various integrated marketing communications strategies and media platforms. Energy drink products are promoted through network and cable television advertisements that feature music and action-oriented lifestyles.[17,18] Television advertising for energy drinks declined between 2010 and 2013 for preschoolers aged 2 to 5 years (−25%), children aged 6 to 11 years (−27%), and adolescents aged 12 to 17 years (−23%).[17] However, digital media marketing that encourages energy drink brand engagement targeting adolescents and young adults has increased.[15,19] A US study found that Red Bull (Red Bull North America Inc),

Table. Examples of energy drink product brands, manufacturers, cost per serving, ingredients, and marketing claims for the top 12 energy drink products based on 2018 US sales[a]

Product brand	Manufacturer	Cost[b] per popular serving size	Calories per popular serving size	Caffeine content per popular serving size	Active ingredients	Marketing slogans, taglines, or claims
Red Bull Original	Red Bull North America Inc	$2.29/8.4 fl oz (250 mL)	110 kcal/8.4 fl oz (250 mL)	80 mg	Caffeine; taurine; vitamins B-3, B-5, B-6, B-12; sucrose; and glucose	*Gives you Wiiings!* *Wiiings for Every Taste* *Red Bull Energy Drink gives you wings whenever you need them* *Vitalizes Body and Mind*
Monster Energy Original	Monster Beverage Corp	$2.49/16 fl oz (473 mL)	210 kcal/16 fl oz (473 mL)	160 mg	Caffeine; taurine; L-carnitine; inositol; panax ginseng extract; guarana; glucuronolactone; maltodextrin; riboflavin; vitamins B-3, B-6, B-12; sucrose; glucose; and sucralose	*Unleash the Beast!*
Red Bull Sugar-Free	Red Bull North America Inc	$2.29/8.4 fl oz (250 mL)	5 kcal/8.4 fl oz (250 mL)	80 mg	Caffeine; taurine; vitamins B-3, B-5, B-6, B-12; sucrose; ace-K[c]; and aspartame	*Total Zero. Zero Sugar. 100% Wiiings.*
Monster Energy Zero Ultra	Monster Beverage Corp	$2.49/16 fl oz (473 mL)	0 kcal/16 fl oz (473 mL)	140 mg	Caffeine; L-carnitine; inositol; taurine; vitamins B-3, B-5, B-6, B-12; sucralose; and erythritol	*Unleash the Ultra Beast!*
Nos	Monster Beverage Corp	$2.29/16 fl oz (473 mL)	210 kcal/16 fl oz (473 mL)	160 mg	Taurine; L-carnitine; inositol; panax ginseng extract; vitamins B-6 and B-12; high fructose corn syrup; and sucralose	*You only live NOS*
Monster Energy Lo Carb	Monster Beverage Corp	$2.49/16 fl oz (473 mL)	25 kcal/16 fl oz (473 mL)	140 mg	Taurine; L-carnitine; inositol; panax ginseng extract; guarana; glucuronolactone; maltodextrin; riboflavin; vitamins B-3, B-6, B-12, glucose; and sucralose	*Unleash the Beast!*

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Table. Examples of energy drink product brands, manufacturers, cost per serving, ingredients, and marketing claims for the top 12 energy drink products based on 2018 US sales[a] (*continued*)

Product brand	Manufacturer	Cost[b] per popular serving size	Calories per popular serving size	Caffeine content per popular serving size	Active ingredients	Marketing slogans, taglines, or claims
Monster Mega Energy	Monster Beverage Corp	$2.49/24 fl oz (720 mL)	320 kcal/24 fl oz (720 mL)	240 mg	Taurine; L-carnitine; inositol; panax ginseng extract; guarana; glucuronolactone; maltodextrin; riboflavin; vitamins B-3, B-6, B-12; sucrose; glucose; and sucralose	*Unleash the Beast!*
Red Bull The Blue Edition	Red Bull North America Inc	$2.29/8.4 fl oz (250 mL)	110 kcal/8.4 fl oz (250 mL)	80 mg	Caffeine; taurine; vitamins B-3, B5, B-6, B-12; and sucrose	*Gives you Wiiings!*
Rockstar Original	Rockstar, Inc	$2.19/16 fl oz (473 mL)	260 kcal/16 fl oz (473 mL)	160 mg	Taurine; L-carnitine; inositol; panax ginseng extract; guarana; glucuronolactone; riboflavin; vitamins B-3, B-5, B-6, B-12; sucrose; and glucose	*Party Like a Rockstar*
Red Bull The Yellow Edition	Red Bull North America Inc	$2.29/8.4 fl oz (250 mL)	120 kcal/8.4 fl oz (250 mL)	80 mg	Caffeine; taurine; vitamins B-2, B-3, B-6, B-12; and sucrose	*The Taste of Tropical Fruit* *The Wiiings of Red Bull*
Monster Juice	Monster Beverage Corp	$2.49/16 fl oz (473 mL)	230 kcal/16 fl oz (473 mL)	152 mg	Caffeine; L-carnitine; inositol; taurine; vitamins B-3, B-5, B-6, B-12; sucrose; glucose; and sucralose	*Unleash the Beast!* *The juice with the natural boost!*
Rockstar Pure Zero	Rockstar, Inc	$2.19/16 fl oz (473 mL)	0 kcal/16 fl oz (473 mL)	240 mg	Taurine; L-carnitine; inositol; panax ginseng extract; guarana; glucuronolactone; vitamins B-3, B-5, B-6, B-12; erythritol; ace-K; and sucralose	*Party Like a Rockstar*

[a]Sources: Mintel, [3] Mordor Intelligence, [4] and Foster[5] and the websites of the top three US manufacturers of energy drink products: Red Bull US and Red Bull North America (headquartered in Santa Monica, CA): https://www.redbull.com/us-en/; Monster Beverage Corporation (headquartered in Corona, CA): https://www.monsterenergy.com/; Rockstar, Inc. (headquartered in Las Vegas, NV): http://rockstarenergy.com/company.

[b]Information in US billion dollars obtained from products purchased and examined in Blacksburg, VA, at the Kroger retailer including pricing as of August 10, 2019.

[c]ace-K=acesulfame potassium.

Year	Actor and actions
2010	• FDA[a], FTC[b], and the Alcohol and Tobacco Tax and Trade Bureau issued warning letters to four energy drink manufacturers that combined alcohol and caffeine in marketed energy drinks due to health risks of consumers, mislabeling that prevented interstate commerce, and deceptive advertising.
2011	• AAP[c] Committee on Nutrition, Council on Sports Medicine and Fitness released a policy statement discouraging energy drink use and encouraging water as the preferred beverage for children and adolescents.
2012	• FDA investigated adverse event reports and deaths associated with energy drinks use. • New York State Attorney General investigated three energy drink manufacturers including Monster Beverage (Monster Energy), PepsiCo (Amp), and Living Essentials (5-hour Energy Drink) for misleading or deceptive advertising of their products.
2013	• US Senate Commerce Committee initiated a public hearing for energy drink manufacturers and requested voluntary commitment to strengthen restriction of energy drink marketing to children and adolescents.
2014	• US Senate Commerce Committee issued the final report with recommendations for the FDA, energy drink manufacturers, and other stakeholders. • Center for Science in the Public Interest sent a letter to the FDA Commissioner recommending regulatory agency actions to restrict energy drink marketing to young consumers including brands through social media.
2016	• NCAA[d] rejected a marketing campaign for the energy drink Xyience (Big Red Ltd) because the product's ingredients were not permitted by their policy.
2017	• FTC investigated health claims and misleading or deceptive advertising by celebrities and influencer marketers on social media, but it was unclear whether these citations addressed celebrity endorsements of energy drink brands and products. • AAP reaffirmed the policy statement discouraging energy drink use and encouraging water as the preferred beverage for children and adolescents. • ABA[e] released voluntary guidelines for member firms to label energy drink products as beverages and not dietary supplements, to restrict energy drink marketing to children under 12 years, and to restrict the availability and marketing of energy drinks to students in grades K-12 in school settings. ABA also pledged to work with a third party to monitor the implementation of these commitments.
2018	• ACSM[f] released a statement that recommended protecting children and adolescents from energy drink marketing; that energy drink use should be discouraged before, during, or after strenuous physical activity or exercise; and that support for public education should be encouraged, including school-based curricula, to raise awareness about the harms associated with the frequent and excessive use of energy drink products. • FDA released industry guidance for "highly concentrated caffeine" in dietary supplements including liquid supplements such as energy shots.
2019	• AAP and AHA[g] jointly released a policy discouraging the use of energy drinks among young people and encouraging water as the preferred beverage for children and adolescents. • The NCAA released a list of banned substances for college athletes that included previously banned substances such as caffeine (guarana) and advised that using dietary supplements may produce a positive test for banned substances that could disqualify participation in athletic events. • Connecticut and Indiana state legislatures considered establishing a minimum-age law that would require identification to purchase energy drinks for individuals under 16 years, and the sale or distribution of energy drinks to minors would result in financial penalties for individuals and businesses.

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Figure 1. Timeline of US actions to address energy drink marketing targeting vulnerable populations, 2010-2019.

Year	Actor and actions
	• FDA issued a request for public comment on the Responsible Innovation in Dietary Supplements to update DSHEA[h] to protect the public from unsafe products while encouraging industry to manufacture and market effective dietary supplements.

[a]FDA=Food and Drug Administration.
[b]FTC=Federal Trade Commission.
[c]AAP=American Academy of Pediatrics.
[d]NCAA=National Collegiate Athletic Association.
[e]ABA=American Beverage Association.
[f]ACSM=American College of Sports Medicine.
[g]AHA=American Heart Association.
[h]DSHEA=Dietary Supplement and Health Education Act.

Figure 1. *(continued)* Timeline of US actions to address energy drink marketing targeting vulnerable populations, 2010-2019.

Monster (Monster Beverage Corp), Rockstar (Rockstar, Inc), and 5-hour Energy (Living Essential) brands were present on six social media and marketing platforms owned by Facebook, Twitter, Instagram, YouTube, LinkedIn, and Google; Red Bull led with nearly 59.5 million followers vs Monster Energy with 29.7 million followers.[20]

Energy drink brands are also marketed to youth and young adults involved in action sports at various venues through corporate sponsorship of professional athletes, sports teams, and sporting events including skateboarding, snowboarding, gaming, and car, motorcycle, and bicycle racing. Branded gifts, incentives, and free product samples are often provided at these events.[3,21] Red Bull and Monster manage competitive development programs for young athletes aged 13 to 21 years who serve as ambassadors to represent their brands and products on college campuses and in other settings.[21,22]

Energy drink brands are promoted by influencer marketers and entertainment celebrities who partner with companies[23] that use appealing packaging, affordable pricing, retail positioning[2,5,11,12,23]; and marketing claims, slogans, and taglines that associate these brands with action sports, enhanced physical performance, and endurance (Table).[2,3,11] The decline in US carbonated sugary beverage sales over the past decade has led to increased sales of sparkling flavored waters and energy drinks.[24] New and reformulated energy drink products are marketed with reduced or 0 calories, no added sugars, and nonnutritive sweeteners to health-conscious adolescents and young adults to promote weight loss and physical fitness, yet still contain high amounts of caffeine and other potentially harmful proprietary ingredients.[2-5,12,15]

SAFETY, HEALTH RISKS, AND PREVALENCE OF ENERGY DRINK USE

The US federal regulatory system is comprised of policies, guidelines, standards, legislation, and laws to ensure that food and beverage products and dietary supplements are safe and effective for Americans to purchase and consume. The FDA allows manufacturers to market energy drink products either as a beverage or dietary supplement, which have different product labeling requirements and pre- or post-marketing adverse event disclosures.[25] Energy drinks marketed as beverages must comply with the Food, Drug and Cosmetics Act and ingredients must be FDA-approved additives or generally recognized as safe substances for their intended use. Energy drinks marketed as dietary supplements must be labeled according to the Dietary Supplement Health and Education Act.[26]

The FDA classifies caffeine as a generally recognized as safe substance that can be used in beverages $\leq$200 parts per milliliter or milligrams per liter.[27] The Dietary Guidelines for Americans 2015-2020 recommended that 400 mg/day caffeine intake is safe for populations over 2 years, which represents two or three 8-oz cups of coffee providing 95 to 200 mg caffeine per 8-oz cup.[28] The FDA has not established a caffeine threshold for young people. However, the American Academy of Pediatrics (AAP) recommended that adolescents aged 12 to 18 years should not consume more than 100 mg/day caffeine, which is equivalent to 1 cup of coffee.[13] The Table shows the composition of popular US energy drink brands offering 80 to 240 mg caffeine and 0 to 320 calories per 8- to 24-fl oz serving.

An extensive body of research has documented many potential adverse side effects associated with the frequent consumption of energy drinks including weight gain and dental caries due to the high calorie and added sugars content; anxiety, nausea, high blood pressure, hyperactivity, insomnia, dysphoria, seizures, and cardiac arrhythmias; and myocardial infarction, renal failure, or death associated with caffeine toxicity or combining energy drinks with alcohol, prescription medications, or other bioactive substances.[2,13-15,29,30]

Between 2005 and 2011, US emergency department visits associated with energy drinks doubled from 10,068 cases in 2007 to 20,783 cases in 2011, and visits were higher for men vs women and for adults aged 18 to 39 years.[31] Of these cases, 58% involved energy drinks only, whereas 42% involved combining energy drinks with alcohol or prescription medications.[31]

Three national surveillance systems are used to monitor adverse events related to energy drink consumption including the FDA's Adverse Event Reporting System, US National Poison Data System, and Drug Abuse Warning Network.[32] Between 2000 and 2012, about 70% of acute and unintentional adverse events were associated with dietary supplement exposure among children under 6 years.[33] A

Recommendations

When working with federal government agencies

- Petition the FDA[a] through a public comment process or coalition letter to clearly define the constituents of energy drink, sports drink, and other "functional" beverage products.
- Request that the FDA establish a safe daily caffeine consumption threshold for children and adolescents, initiate a rulemaking process to require energy drink manufacturers to disclose the caffeine and other stimulant ingredients, and cap the maximum caffeine content of "beverages" to 0.02%, or 71 mg/12 oz, in accordance with FDA's regulatory guidelines.
- Work with coalitions or alliances to request the FDA to initiate a rulemaking process to require a warning label on energy drink products to address potential health risks to vulnerable consumers and to evaluate the impact of warning labels on consumers' perceptions and behaviors.
- Encourage the FDA to develop and release guidelines for industry on the voluntarily reporting of adverse events associated with energy drink products and to urge energy drink manufacturers to provide this information to relevant surveillance systems.
- Request the FDA and FTC[b] to investigate misleading or deceptive advertising and marketing of energy drink products that target children and adolescents, and request that these regulatory agencies issue a report with recommendations for energy drink manufacturers to strengthen responsible marketing to these populations.
- Work with the CDC[c] and other federal agencies to design, implement, and evaluate a public awareness campaign about the harms associated with the frequent and excessive consumption of energy drink products and to replace energy drink products with healthy beverages.

When working with state or local government agencies

- Explore public support for legislation to enact a sugary beverage tax that includes energy drinks to reduce their affordability to children and adolescents under 18 years.
- Support legislation to require a public health warning about the potential harms associated with energy drinks consumed by children and adolescents under 18 years, evaluate how warning labels influence peoples' perceptions and behaviors, and explore public support for minimum-age laws to restrict energy drink product marketing to children and adolescent under 18 years.

When working with energy drink manufacturers and industry trade associations

- Encourage energy drink manufacturers to fulfill their voluntary commitments to not market their products to children and adolescents up to age 18 years and not market energy drinks to students in K-12 school settings.
- Petition or request energy drink manufacturers to stop marketing caffeinated energy drink products that use health claims to promote the benefits of consuming energy drinks for hydration following rigorous physical activity.
- Urge the ABA[d] to strengthen its voluntary commitments to restrict energy drink marketing to adolescents under age 18 years and to release a public report on the compliance of energy drink manufacturers for implementing this pledge.

When working with professional societies, health care providers, and civil society organizations

- Request that the Academy update existing position or practice papers to identify policies and actions to address energy drink views and use among Americans, to develop corporate sponsorship guidelines for members relevant to energy drink manufacturers, and to promote the responsible consumption of energy drinks within a broader effort to promote healthy beverage consumption and healthy dietary patterns.
- Collaborate with physicians and other health care providers to screen for energy drink use during annual medical examinations and dietary assessments and to educate patients and clients about replacing energy drinks with healthy beverages and reducing or eliminating the frequent or excessive consumption of energy drinks.

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Figure 2. Recommended policies and actions for practitioners in various settings to address energy drink products used by vulnerable US populations.

- Work with other public health and health care practitioners to report adverse events related to energy drinks to appropriate surveillance systems including the FDA's Adverse Reporting Program and National Poison Control Center and to report emergency department visits to the Drug Abuse Warning Network.
- Conduct research to examine the safety of energy drink products, consumed alone or combined with other products, by vulnerable populations, and identify the conditions and that drive adverse events related to energy drink use.
- Collaborate with civil society organizations and advocacy coalitions to monitor and evaluate industry and government actions to address energy drink marketing to young people, and share the results with policy makers and government regulatory agencies.
- Implement and evaluate a public awareness campaign to promote healthy beverages and discourage energy drink use by children and adolescents.
- Work with advocacy organizations to support laws that require warning labels and restrict young people's access to energy drinks.

[a]FDA=Food and Drug Administration.
[b]FTC=Federal Trade Commission.
[c]CDC=Centers for Disease Control and Prevention.
[d]ABA=American Beverage Association.

Figure 2. *(continued)* Recommended policies and actions for practitioners in various settings to address energy drink products used by vulnerable US populations.

retrospective analysis of the FDA's Adverse Event Reporting System (2004-2015) for self-reported use of dietary supplements by children, adolescents, and young adults from birth to 25 years suggested that severe medical events were three times more likely for energy drinks and weight loss supplements compared with vitamins.[34]

Adolescents and young adults who consume energy drinks tend to engage in other undesired behaviors including cigarette smoking, screen media use, combining energy drinks with alcohol, and consuming excessive sugary beverages linked to obesity and dental caries.[3,10,35,36] Older adolescents also perceive energy drinks to be safe and comparable to sports drinks.[15,35]

The estimated prevalence of energy drink use varies widely depending on study design and population.[1,2,12-14] A National Health and Nutrition Examination Survey 2002-2010 analysis found that only 2.7% of American adults consumed energy drinks, which was especially prevalent among young adult men aged 19 to 30 years.[37] A separate study of energy drink use among US military personnel (n=586) similarly found that young adult men aged 18 to 29 years were more frequent users who reported at least one adverse side effect associated with use, which included palpitations, restlessness, and trouble sleeping.[38]

A National Health and Nutrition Examination Survey 2003-2016 analysis[39] found an increase in the prevalence of energy drink consumption by US adolescents aged 12 to 19 years (0.2% to 1.4%) and young adults aged 20 to 39 years (0.5% to 5.5%). The investigators found a significant per capita increase for young adults and a higher total caffeine intake from energy drinks for adolescents (227.0 mg vs 52.1 mg) and young adults (278.7 mg vs 135.3 mg) compared with nonconsumers. Although these caffeine levels are below the Dietary Guidelines for Americans recommended 400 mg/day for healthy people, concerns remain about the frequent and excessive consumption of energy drinks among adolescents and young adults.[39]

US PROGRESS TO IMPLEMENT RECOMMENDED ACTIONS FOR ENERGY DRINK PRODUCTS, 2010-2019

Figure 1 and the following section describe actions taken by federal agencies and other stakeholders to restrict energy drink marketing to vulnerable populations from 2010 to 2019. The FDA has authority over the safety of energy drinks and transparency in product labeling, may investigate adverse events related to energy drinks, and is responsible for alerting the public if unsafe ingredients are promoted by manufacturers. The Federal Trade Commission (FTC) has regulatory authority to investigate misleading and deceptive advertising and marketing of energy drinks through digital and social media. In 2010, the FDA, FTC, and Alcohol and Tobacco Tax and Trade Bureau issued warning letters to four energy drink manufacturers that had combined alcohol and caffeine in marketed products to address the health risks for consumers, mislabeling of products, and deceptive advertising.[40]

Between 2010 and 2012, several adverse events and deaths were reported to the FDA associated with energy drinks and energy shots consumed by adolescents and young adults.[9,10] In 2012, the New York State Attorney General investigated three energy drink manufacturers for violating federal law by promoting energy drinks as dietary supplements instead of beverages that required more stringent labeling disclosures.[41]

In response to the reported adverse events, a US Senate Commerce Committee conducted a public hearing on energy drinks in 2013[7] that requested 16 energy drink manufacturers to voluntarily commit to not market to young people up to 18 years.[7,8] The Committee's 2014 report found that some manufacturers had restricted marketing to children under 12 years and in school settings; however, inadequate actions were taken to protect adolescents aged 12 to 18 years from other marketing practices that promoted energy drink products.[7-8] The report issued several recommendations for the FDA and

energy drink manufacturers to restrict the marketing of products to young people including through social media.[7-8]

Between 2011 and 2019, several professional societies released policy statements to restrict or discourage energy drink access and use by children and adolescents. These include the AAP in 2011,[13] American College of Sports Medicine in 2018,[15] and the AAP and American Heart Association in 2019 (Figure 1).[14] The National Collegiate Athletic Association rejected a marketing campaign for Xyience (Big Red Ltd) in 2016 that contained ingredients banned by the National Collegiate Athletic Association.[42] The National Collegiate Athletic Association provides a public list of banned substances that include caffeine, the stimulant guarana, and botanicals used in proprietary blends of energy drink products, which could disqualify athletes from participating in collegiate events.[43]

In 2017, the FTC issued more than 90 letters to celebrities and social media influencers that required clear discloses of cobranded, paid marketing relationships when endorsing branded products through social media.[44] The FTC also requires using verbal or written social media disclosures, using prominent display and adequate screen time for people to read disclosures, tagging sponsored brands, and using clear and unambiguous language such as "sponsored by, paid advertisement or sponsored advertising content."[45] It is unclear whether these citations included the marketing of energy drink products.

In 2017, the American Beverage Association released voluntary guidelines for members to label energy drink products as beverages and not dietary supplements and to restrict energy drinks to children under 12 years and to students in kindergarten through 12th grade in schools. These voluntary marketing commitments have not been applied to adolescents aged 12 to 18 years outside of school settings.[46] The American Beverage Association pledged to work with a third party to monitor the implementation of the energy drink manufacturers' commitments[46]; however, no report has been publicly released. In 2018, the FDA released guidance for industry on using concentrated caffeine in beverage or dietary supplement products that "may present a significant or unreasonable risk of illness or injury for use suggested in labelling."[47]

In 2019, the Connecticut and Indiana state legislatures considered but did not enact minimum-age laws preventing youths under 16 years from purchasing energy drinks.[48,49] In 2019, the FDA requested public comments on updating the Dietary Supplement Health and Education Act to protect the public from unsafe products including energy drinks.[50] There was no evidence that the FDA had initiated a public campaign to raise consumers' awareness about the risks of excessive energy drink consumption. The FDA has not established a caffeine threshold for young people under 18 years, but many European countries have enacted laws that regulate energy drinks for young people.[51]

The European Food Safety Authority set a safe caffeine consumption level at 3 mg/kg body weight per day for children and adolescents.[52] Health Canada established maximum caffeine intake guidelines for healthy adults (400 mg/day) and lower levels for pregnant women (300 mg/day) and children and adolescents (2.5 mg/kg body weight or 45 to 85 mg/day).[53,54]

A comprehensive review of global policies and their effectiveness to restrict energy drink product availability and use is beyond the scope of this commentary. However, certain countries have taken measures to restrict their availability to vulnerable populations. A 2018 report issued by the House of Commons in England[55] prompted a national law to ban energy drink products to youth under 16 years effective September 2019.[56] Public health advocates have recommended that the US government ban energy drinks or require warning labels.[11,16] Warning label legislation and minimum-age laws to purchase energy drinks should be evaluated for how these influence the perceptions, purchasing, and consumption behaviors of consumers and lead to changes in industry marketing practices. Evidence from Australia suggests that young adults neither notice nor comply with energy drink product warnings.[57] Government warning label legislation in the United Kingdom led retailers of energy drinks to make only modest reductions in the sugar, energy, and caffeine content and small changes to downsize products to discourage consumption by frequent users.[58]

POLICY AND PRACTICE IMPLICATIONS

Figure 2 summarizes potential recommendations for RDNs who work with government, industry, health care providers, professional societies, schools, and consumer advocacy organizations to limit energy drink purchasing and consumption. Professionals could submit public comments to federal agencies in response to notices of proposed rulemaking posted in the *Federal Register*, including the FDA and Health and Human Services on the forthcoming Dietary Guidelines Advisory Committee report. RDNs could participate in the process of updating the Academy's position and practice papers to address sugary beverages and energy drinks[59-61]; provide input to the Academy about corporate sponsorship guidelines for energy drink manufacturers[62]; and develop a new position paper on healthy beverage consumption across the life span drawing from other reports, including the Healthy Eating Research's expert panel recommendations on healthy beverages throughout the life span.[63-64] RDNs could also inform research and education about using energy drinks within the context of promoting nutrient-dense dietary patterns and a healthy weight. Validated dietary assessment tools[65-67] are available for RDNs to research ingredients that produce metabolic and cardiovascular abnormalities[68] and to help in understanding how energy drink products influence diet quality and health.

Finally, RDNs may have opportunities to work with state and national advocacy organizations and coalitions to design model policies that include full-calorie energy drink beverages in sugary beverage excise taxes[11,12,14,69]; to support state or local legislation that would require energy drinks to carry warning labels, increase pricing to discourage use, or establish minimum-age laws for youth to purchase energy drinks[48,49,70]; and design targeted education campaigns to raise awareness about the health risks of energy drink misuse.[14,69,71]

SUMMARY

In 2018, the US energy drink market was $11 billion dollars. These products were marketed extensively to US children, adolescents, and young adults who are especially vulnerable to the adverse dietary and health effects of these products.

Although individual autonomy and commercial interests are important considerations, major health organizations such as the AAP, American College of Sports Medicine, and the American Heart Association have discouraged energy drink use among children, adolescents, and young people. As the nutrition experts, RDNs have opportunities to impact national policies related to energy drink marketing and usage via collaborations with various stakeholder groups, including local, state, and federal government agencies, industry groups, professional societies, and health care providers.

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V. I. Kraak led the conceptualization of the outline, evidence review, and wrote the first draft. B. M. Davy, M. S. Rockwell, S. Kostelnik, and V. E. Hedrick contributed supporting evidence, provided analysis and feedback on several manuscript drafts, and developed the summary tables. V. I. Kraak coordinated all co-authors' feedback and led the submission process. All authors read and approved the final submission.