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TOX/2018/17

COMMITTEE ON TOXICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT

ENERGY DRINKS- REPORT FROM #NOTFORCHILDREN CAMPAIGN

Introduction

1. Members will be aware of continuing consumer concerns regarding the possible adverse effects of energy drinks in children. Following the recent #notfor children campaign and its subsequent media coverage, a number of retailers have voluntarily restricted the sale of energy drinks to children under 16. Although the sale of energy drinks to under 16s is not recommended and the drinks are labelled accordingly, the aim of the campaign is for their sale to children to be banned.

2. The #notforchildren campaign have submitted a report to the Department of Health (DH) who have requested advice from the Food Standards Agency (FSA). The Committee are asked for their comments on the report, whether it adds anything new to the recent EFSA opinion and whether further work is needed.

Background

3. Energy drinks contain caffeine and may contain sugar or sweeteners as well as other ingredients such as vitamins and minerals, D-glucurono-γ-lactone and the amino acid taurine. The concentration of caffeine and the volume of the drink cans and bottles varies, so that a typical 250 ml can of energy drink (e.g. Red Bull) contains around 80 mg of caffeine. Larger cans (e.g. Monster) contain 180 mg caffeine in a 500 ml can; but larger pack sizes ≥ 1L bottles are also available. More concentrated shot drinks where a caffeine content of 150-200 mg will be present in a much smaller volume, 10-50 ml are also on the market. These products appear to be less widely available and are generally marketed at adults as pre-work out supplements.

4. Three cans of cola or a mug of instant coffee would also contain 80 mg caffeine. A shot of espresso contains approximately 75 mg caffeine (Caffeine informer, 2018); coffee shop beverages will generally contain one or two shots of espresso depending on the size.

Current regulations and advice

5. Caffeine may be used as a flavouring at permitted levels in non-alcoholic drinks. However, if it is added for physiological effect there is no upper limit and it falls outside the flavourings legislation. Labelling legislation requires that high caffeine drinks, over 150 milligrams of caffeine per litre of drink, must state “High

caffeine content. Not recommended for children or pregnant or breast-feeding women".

6. There are no specific regulations preventing the sale of energy drinks to children. The FSA advice is that children and those sensitive to caffeine should consume caffeinated drinks in moderation.

7. In their voluntary code of practice, the British Soft Drinks Association (BSDA) recommend that they are not sold to children under 16 and the drinks carry a label stating that they are not suitable for children under 16.

8. Pregnant women are advised not to consume more than 200 mg caffeine/day due to the risk of decreased birthweights.

Adverse effects

9. The adverse effects of caffeine have not been considered in detail for this paper, further information is given in the EFSA opinion. In summary, caffeine can increase arousal, irritability, nervousness and anxiety in some subjects, particularly if they are normally low consumers (SCF cited in EFSA, 2015). It also increases heart rate and blood pressure. Caffeine doses > 100 mg may increase sleep latency and reduce sleep duration in some individuals, particularly if consumed near bed time. Tolerance develops to some, but not all, of the effects of caffeine and the development of tolerance is highly variable among the population (EFSA, 2015). Other effects reported for caffeine include gastric irritation, nausea and vomiting, headache, chest pain and ringing in the ears (WebMD, 2018).

Expert Opinions

EFSA panels.

EFSA (2009)

10. The EFSA ANS Panel (EFSA, 2009) concluded that exposure to taurine and D-glucurono-γ-lactone at levels commonly used in energy drinks was not of safety concern even for consumers of high levels. It was further concluded that it was unlikely that D-glucurono-γ-lactone would have any interaction with caffeine, taurine, alcohol or the effects of exercise. However, the combination of taurine and D-glucurono-γ-lactone with themselves and other components of energy drinks was not comprehensively assessed.

EFSA (2015)

11. The EFSA NDA panel (EFSA, 2015) opinion on the safety of caffeine was published in 2015. The EFSA panel stated that a single dose of 200 mg did not give rise to safety concerns (approximately 3 mg/kg bw for a 70 kg adult). Habitual caffeine intake of 400 mg would also not be of concern. For children and adolescents, there were insufficient data to set a safe caffeine intake, but the caffeine intakes of no concern derived for acute consumption in adults (3 mg/kg

bw/day) may serve as a basis to derive single doses of caffeine and daily intakes of no concern for these population sub groups.

12. The NDA panel also considered the effects of caffeine in combination with other common constituents of energy drinks at typically used concentrations (300-320, 4000 and 2,400 mg/L for caffeine, taurine and D-glucurono-γ-lactone respectively) would not affect the safety of single doses of caffeine up to 200 mg or the habitual consumption of caffeine up to 400 mg/day. Any possible interaction with sugar was not considered.

#notforchildren report.

13. The #notforchildren report and its supporting paper is attached at Annex A. The summary paper sets out the key points of the campaign, citing a number of references not included in the EFSA opinion or published after it. The papers include 3 survey/focus group studies (Visram *et al*., 2017; Hammond *et al*., 2018; University of Hertfordshire, 2017) which discuss the use and perception of energy drinks and the adverse effects experienced as well as information on composition (Higgins *et al*., 2010) a mini-review (Al-Shaar *et al*., 2017) and an editorial piece (Generali *et al*., 2013).

14. The #notforchildren presentation reports the concerns of the public, parents and teachers regarding the effects of energy drinks, plus media and social media coverage. A parliamentary question relating to the suicide of a young man who consumed over 15 cans of energy drink per day, which his family believed possibly contributing to his anxiety is also included.

15. Of the literature cited, the most relevant paper is by Hammond *et al*., (2018) who reported a web-based survey of Canadian 11-17 y olds. Of the 1516 respondents who had consumed energy drinks, 55.4% had experienced at least one adverse event including fast heartbeat (24.7%), difficulty sleeping (24.1%) headache, (18.3%) nausea/vomiting/diarrhoea (5.1%) chest pain (3.6%) and seizures (0.2%). It was reported that 3.1% had sought or considered seeking medical help. The prevalence of reported adverse events was significantly greater among energy drink consumers than coffee consumers (1741 consumers with 36% reporting adverse events) OR;95%CI 2.67; 2.01-2.56. The proportion of individuals who reported seeking, or considering seeking medical help (3.1 vs 1.4%) 2.18; 1.39-3.41 was also higher in the energy drink consumers. When considered by adverse event, energy drink consumers were more likely to report “jolt and crash” episodes, headache, jitteriness/shaking, difficulty sleeping, fast heartbeat and chest pain than coffee drinkers. The numbers of consumers reporting nausea/vomiting/diarrhoea and seizures were the same in both groups.

Other new literature

16. A preliminary literature search has found a number of studies on the effects of energy drink consumption in children and adolescents which were published after, or not included in, the 2015 EFSA opinion. The individual studies have not been

considered here in detail but they include a study by Costa *et al*. (2016) which surveyed 399 Australian adolescents aged 12-18 about their use of energy drinks noting that 56% of the consumers had experienced adverse effects, most commonly increased heart rate, rapid speech, upset stomach, insomnia, anxiety and tremors. In a cross-sectional study, Park *et al*. (2016) reported that energy drink consumption had detrimental effects related to stress, sleep dissatisfaction, mood and suicidality alone or in combination with junk food consumption in Korean adolescents; similar findings were reported by Kim *et al*., (2017). In contrast, a cross-sectional study of 2307 UK children by Richards and Smith, (2016a) found that, although there was an initial association, energy drink consumption was not predictive of stress, anxiety or depression at 6 month follow up. In a second study Richards and Smith (2016b) found that high weekly caffeine intake (>1000 mg/week) was associated with poor health at 6 months but not at baseline: further analyses indicated that they were causally linked.

17. A review by Visram *et al*. (2016) notes higher odds of health damaging behaviours as well as physical symptoms such as headaches, stomach aches, hyperactivity and insomnia.

Summary and discussion

18. In 2015, EFSA concluded that intakes of 3 mg/kg bw/day would be an intake of no concern in children and adolescents. Current FSA advice, based on that opinion, is that, children and those sensitive to caffeine should only consume it in moderation. Energy drinks are not intended for children under 16 and carry voluntary labelling to that effect.

19. However, as a result of concern about the effects of energy drink consumption on children and adolescents, #notforchildren are campaigning for sale of these products to under 16s be banned and a number of retailers have voluntarily done this. The #notforchildren submission is attached to this paper and cites some studies not included in the 2015 EFSA opinion. The adverse effects reported in the study by Hammond *et al*., 2017 are consistent with those already reported for caffeine or which might be expected given the pharmacological properties of caffeine. Additional literature searching has identified a number of other studies, some of which indicate adverse health effects associated with energy drink consumption. Some of the new information is not toxicological in nature and might need input from other specialities to fully assess it since it relates more to behaviours, consumer perception and psychology.

Questions for the Committee

20. Members are asked:

a) For their comments on the #notfor children report?
b) For their comments on the other information in this paper?
c) Whether the report adds anything new to the topic, most recently considered in the 2015 EFSA opinion?

d) Whether a review of caffeine in children and adolescents is required?
e) If so, what information should be covered and is additional expertise needed in some areas?
f) Should other ingredients of energy drinks be considered, either alone or in combination with each other and/or caffeine?
g) If they have any other comments?

Secretariat
March 2018

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