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VOXPOP

Why banning energy drinks doesn't make sense

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Summary

- The government has proposed a ban on the sale of energy drinks to minors on the basis that these products have high levels of sugar and caffeine, and can be damaging to health.
- Many energy drinks are low in sugar or contain no sugar at all. Even full sugar energy drinks do not contain more sugar than *Pepsi*.
- All the leading energy drink brands have 32 mg of caffeine per 100 ml. This is more than tea and cola but less than any form of caffeinated coffee. Most single-serve coffees from leading high street retailers contain more caffeine than a can of energy drink.
- Young people consume far more caffeine from tea, coffee and cola than they do from energy drinks. Among 10 to 17 year olds, energy drinks contribute just 10.5 per cent of total caffeine intake. Even the heaviest adolescent consumers of energy drinks get more than 80 per cent of their caffeine from other sources.
- There is no evidence that sugar and caffeine in energy drinks is more problematic than sugar and caffeine in other beverages. A ban on one category of the soft drink market would be discriminatory and disproportionate.

Background

Energy drinks made up 5.2 per cent of the UK soft drinks market in 2018, with 704 million litres sold (BSDA 2019: 15-16). Under Theresa May, the UK government published 'Childhood obesity: a plan for action, chapter 2' in June 2018. Among its proposals was a ban on the sale of energy drinks to 'children'. The ban would apply to 'any drink, other than tea or coffee, which contains over 150mg of caffeine per litre' (DHSC 2018b: 9) and would apply to people aged under 16 or under 18, depending on the results of a public consultation.

Under EU labelling rules, these drinks currently require a label saying that they have a 'high caffeine content' and are 'unsuitable for children and pregnant or breastfeeding women', but they are legal to sell to people of all ages. The only EU states to ban their sale to minors are Lithuania and Latvia.

The UK government has also proposed restrictions on the sale of energy drinks from vending machines. Three options have been suggested: banning their sale from all vending machines, requiring business owners with vending machines to enforce the age restriction, and banning sales of energy drinks in any building with a high child footfall (e.g. sports centres).

An Impact Assessment was published in August 2018 (DHSC 2018) and a public consultation concluded in November 2018. The Scottish government launched a public consultation on a similar proposal in November 2019 (Fitzpatrick 2019).

Shortly after the UK consultation closed, the House of Commons Science and Technology Committee (2018: 21) published a report which concluded that 'the current scientific evidence alone is not sufficient to justify a measure as prohibitive as a statutory ban on the sale of energy drinks to children'.

Health concerns

Energy drinks contain a range of ingredients, such as guarana, ginseng and taurine, which are not typically found in other soft drinks. All of them are considered safe at the levels found in energy drinks. Some of them, such as folic acid and B vitamins, have proven health benefits. The government has expressed little concern about these ingredients, saying: ‘Caffeine and high sugar content are the two main concerns with energy drinks’ (DHSC 2018: 26).

Sugar

As the ban was proposed in the Childhood Obesity Plan, calories from the sugar in energy drinks might be expected to be the government's primary concern. Indeed, the Impact Assessment says that a 'decrease in calorie consumption … would contribute to reductions in obesity rates and incidence of dental caries in children' but does not attempt to quantify this (ibid.: 4). It estimates that the proposed ban could reduce energy intake among 10-15 year olds by 8.6 calories per day, rising to 11.4 calories per day for 16 to 17 year olds (ibid.: 32).

If the ban results in minors reducing their consumption of energy drinks, and if they do not consume other sugary drinks as substitutes, it is plausible that their calorie consumption will decline slightly and that this could have a marginal effect on obesity and tooth decay. In reality, the evidence suggests that they probably *will* compensate by consuming other sugary products (Fletcher et al. 2010; Markey et al. 2016), but even if they do not, it is not obvious why one relatively trivial source of sugar - energy drinks - should be singled out for a ban.

Banning the sale of a product because it could lead to excess calorie consumption would be an unprecedented step for any government, even if the ban only applies to minors. There are plenty of products, such as cake or ice cream, which contain more sugar/calories per portion than the average energy drink. Indeed, many other *drinks* contain more sugar/calories than the average energy drink, as Table 1 shows.

Table 1: Sugar content of popular drinks

	Sugar (grams per serving)	**Sugar** (grams per 100 ml)
Boost (250 ml)	12	4.9
Rockstar (500 ml)	24	4.8
Red Bull (250 ml)	28	11
Coca-Cola (330 ml)	35	10.6
Pepsi (330 ml)	36	11
Yazoo milkshake (400 ml)	36	8.9
Coca-Cola (500 ml)	53	10.6
Pepsi (500 ml)	55	11
Monster (500 ml)	55	11
McDonald's milkshake (400 ml)	57	14

Boost and *Rockstar* have been reformulated in recent years to bring their sugar levels below the trigger point for the sugar levy. *Red Bull* and *Monster* continue to have eleven grams of sugar per 100 ml, the same as *Pepsi*. If this is considered a dangerous level that requires the same age restrictions that are traditionally associated with alcohol, tobacco and fireworks, there are many other food and drink products that should get the same treatment. A ban on one category of the soft drink market seems discriminatory and disproportionate.

It should be noted that the ban is expected to be applied to energy drinks which do not contain any sugar. This makes no sense from the perspective of obesity prevention.

Caffeine

In the Ministerial Foreword to the Scottish government's public consultation on banning the sale of energy drinks to children and young people, Joe Fitzpatrick (2019: 2) says:

> Many energy drinks have high levels of sugar. They can also be harmful to oral health due to their acidic nature. However, it is their high caffeine content and the detrimental effect this may have on young people's health that has led to this consultation.

The UK government's Impact Assessment also expresses concern about caffeine, saying: 'The benefits of the policy are the reduction in caffeine consumption, which has been linked to some health decrements' (DHSC 2018: 11).

According to the European Food Safety Authority (2015), 400 mg of caffeine per day is the safe upper limit for adults, a guideline supported by extensive research (Wikoff et al. 2017). For children, EFSA defines a safe level as 3 mg per kg of body weight, e.g. 150 mg for a 14 year old who weighs 50 kg.

Randomised controlled trials have demonstrated that caffeine confers a number of benefits to the user, improving mood, alertness, cognitive ability and sporting performance (Ruxton 2008; Ishak et al. 2012). But caffeine consumption has also been plausibly linked to headaches, irritability and trouble sleeping. In very high doses, it has been known to have more serious adverse effects, particularly to the heart, and there has even been a handful of cases in which people have died from caffeine poisoning (Wolk 2012: 246-7).

Since the government is not proposing a ban on the sale of *caffeine* to minors, the important question is whether caffeine is more problematic in energy drinks than in other beverages. The evidence suggests not.

In one of the few studies to compare the effects of energy drinks on young people with those of other caffeinated beverages, Jackson et al. (2013: 561) found that 'Physiologic effects were not more commonly reported by energy drink users than caffeinated-only beverage users after adjusting for the other covariates'.

Other researchers have reached the same conclusion. Kaminer (2010), for example, says that 'the consumption of EDs [energy drinks] does not seem to carry adverse effects that are any different from drinking similar amounts of other caffeinated beverages'.

Researchers have found a range of behaviours that are *associated* with the consumption of energy drinks (Brunton et al. 2019), but the traditional warning about not inferring causation from correlation is especially true in this field of research. The type of adolescent who consumes energy drinks differs from the type of adolescent who abstains from them. Heavy consumers of these drinks are more different still.

The UK government consultation cites only three published studies as evidence that energy drinks may be harmful to adolescents (DHSC 2018b: 6). The first is the EFSA report mentioned above, which looks at caffeine in general. The second is a Finnish study that has only been published as an abstract (Hihtinen et al. 2013). The study found an association between energy drink consumption and fatigue, irritability and headaches which could be plausibly attributed to reverse causation, i.e. people who suffer from tiredness in the day are more likely to use energy drinks as a pick-me-up. This chicken and egg problem is discussed by Wesensten (2014: 83):

> Although it could be construed that the relationship was causal in nature (i.e., that caffeine use disrupted sleep), an equally likely explanation is that insufficient sleep increased sleepiness, and that sleepiness was the driver of both the caffeine use and reports of stress.

The third study involved New Zealand children and found that young people who consume energy drinks are more likely to engage in risky

behaviours. These include ‘risky motor vehicle use, violent behaviour, unsafe sex, binge drinking, cigarette smoking and disordered eating behaviours’ (Utter et al. 2018: 281). The mechanism by which energy drinks could cause this range of undesirable outcomes is far from obvious, as Wesensten (2014: 83) notes:

> Although it has been hypothesised that excessive caffeine use causes risky behaviour, the most parsimonious explanation for this relationship is that excessive energy drink use is simply another manifestation of risk-taking expressed by individuals who are already predisposed to engage in risky behaviours.

Referring to the New Zealand study specifically, the Impact Assessment accepts that it is ‘highly unlikely energy drinks cause these behaviours’ (DHSC 2018: 30).

Insofar as there is a casual relationship with any of these behaviours, the cause is caffeine, not energy drinks *per se*. And so, as with sugar, we must ask whether energy drinks have unusually high levels of caffeine. As Table 2 shows, they do not. Most single-serve coffees from the leading high street retailers contain more caffeine.

Table 2: Caffeine content of popular drinks

Beverage	Average caffeine content (mg/serving)	Range of caffeine content (mg/serving)
Can of Coca-Cola (330 ml)	32	-
Can of Diet Coke (330 ml)	42	-
Cup of tea	50	1-90
Cup of instant coffee	75	21-120
Shot of Espresso	75	50-322
Starbucks Americano (short)	80	75-85
Can of Red Bull (250 ml)	80	-
Can of Boost (250 ml)	80	-
Cup of brewed coffee	100	-
Filter/ground coffee (190 ml)	105	15-254
Double Espresso	150	100-644
Can of Monster (500 ml)	160	-
Can of Rockstar (500 ml)	160	-
Starbucks Americano (tall)	160	150-170
Costa Americano (primo)	185	-
Starbucks Americano (grande)	240	225-255
Costa Americano (medio)	277	-
Starbucks Americano (venti)	320	300-340
Costa Americano (massimo)	370	-

Figures taken from Ruxton (2013: 343), Starbucks (https://www.starbucks.co.uk/quick-links/nutrition-info) and Caffeine Informer (www.caffeineinformer.com).

All the leading energy drink brands shown above have 32 mg of caffeine per 100 ml, which is more than tea and cola but less than any form of coffee (except decaffeinated coffee, of course).

Behaviour in schools

Much of the campaign against energy drinks is based on a belief that school children who consume them behave badly or are unable to concentrate properly. Leaving aside the problem of confounding mentioned above, the government accepts that there is no empirical evidence for this belief and relies instead on a survey by a teaching union which 'found that when given a choice of 23 potential causes of pupil indiscipline, 13% of teachers and school leaders identified energy drinks as a key cause of the poor behaviour they have witnessed' (DHSC 2018: 30).

Although the House of Commons Science and Technology Committee (2018: 22) concluded that scientific evidence does not support a ban on the sale of energy drinks to minors, it did not necessarily oppose a ban, saying:

> However, we recognise that it might be legitimate for the Government to go beyond the quantitative evidence available and implement a statutory ban on the basis of societal concerns and qualitative evidence, such as the experience of school teachers.

This is true in a strictly legal sense, but from a committee dedicated to science, it is a fudge. Either a policy is evidence-based or it is not. Laws should not be made on the basis of the opinion of a small minority of teachers or in response to 'societal concerns' that may be groundless.

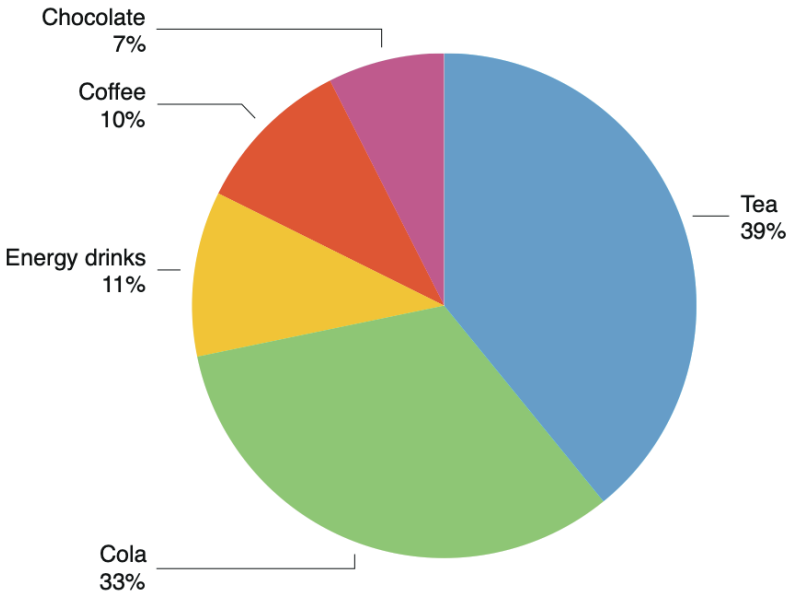
Caffeine consumption by minors

As Table 2 shows, the House of Commons Science and Technology Committee (2018: 14) is right when it says that 'while energy drinks are referred to as being "high-caffeine", in many cases coffee can be much stronger'. The final argument that could be put forward in favour of the proposed ban is therefore that, whilst caffeine in energy drinks is no more prevalent or hazardous than caffeine in hot beverages, minors do not tend to drink many hot drinks, but do tend to drink a lot of energy drinks. This assumption is wholly wrong.

A study by Fitt et al. (2013: 424) shows that British children of all ages get significantly more caffeine from hot drinks than they do from cold drinks. Boys aged 11-18 get an average of 72.5 mg of caffeine from tea and coffee (combined) but only 40.8 mg from soft drinks and energy drinks (combined). Girls aged 11-18 get an average of 76.3 mg of caffeine from tea and coffee (combined) and 36 mg from soft drinks and energy drinks (combined).

The European Food Safety Authority (2015: 96-97) found that energy drinks make up a very small proportion of overall caffeine consumption in the UK. Among children aged 3 to 9 years, they contribute 2.7 per cent of caffeine intake, with cola drinks contributing ten times as much and chocolate contributing eight times as much. Among 10 to 17 year olds, energy drinks contribute just 10.5 per cent of total caffeine intake. As Figure 1 shows, cola accounts for three times as much caffeine, and tea accounts for nearly four times as much.

Figure 1: Sources of caffeine intake for 10-17 year olds (UK)



The main source of caffeine in the UK is not from energy drinks, or even coffee, but from tea. This is true of working age adults, who get 57 per cent of their caffeine from tea, as well as adolescents (39 per cent), children (47 per cent) and even toddlers (76 per cent) (ibid.).

Not everybody consumes energy drinks, of course, and the Impact Assessment expresses concern that 'energy drink consumption may be concentrated in a sub-set of the surveyed population' (DHSC 2018: 26). But even if we exclude abstainers, a similar picture emerges. Zucconi et al. (2013: 113) found that the average UK adolescent consumer of energy drinks ingests 32 mg of caffeine from them per day, amounting to 17 per cent of their overall caffeine intake. Nine out of ten of these consumers ingest less than 100 mg of caffeine per day from energy drinks, and even the heaviest consumers (at the 95th percentile) get less than a fifth of their daily caffeine from energy drinks (ibid.: 113).

The amount of caffeine ingested from energy drinks by the heaviest consumers is well within the EFSA's 'safe level' (consumers at the 95th percentile consume 146 mg/day, or 2.3 mg/kg), but their overall caffeine intake is not. It is probably advisable for this small minority to reduce their

caffeine intake, but even if they drank no energy drinks at all they would still exceed the guidelines. If heavy adolescent caffeine use is the issue, it seems perverse to implement a full ban on the sale of drinks that only provide 18 per cent of their daily caffeine while leaving larger sources of caffeine alone. As the House of Commons Science and Technology Committee (2018: 3) report says:

> Single portions [of energy drinks] are within the European Food Safety Authority's suggested limit for caffeine intake by children. This limit may be exceeded if other products containing caffeine are also consumed, or if energy drinks are consumed in excess, but the same can be said for many products available for sale to young people, including other drinks containing caffeine.

The Impact Assessment claims that 'doing nothing [i.e. not legislating] will still allow under-16s access to drinks with high levels of caffeine'. But, as the data in this briefing paper show, high levels of caffeine will be readily available regardless of how the government regulates energy drinks. A total ban on the sale of one type of caffeinated drink seems arbitrary and unscientific.

Conclusion

Young people consume far more caffeine from tea, coffee and cola than they do from energy drinks. This is true even of the heaviest consumers of energy drinks.

There is, rightly, no campaign to ban the sale of tea, coffee and cola to minors. This may be because nobody has attempted to construct a health panic around them and because these drinks have been around long enough to be generally accepted as safe. But energy drinks are not new products. They had been on the market for a quarter of a century before the campaign against them began, and the campaigners never seem to be quite sure whether they see their sugar or caffeine content as the problem. They have made some extreme assertions that do not stand up to science, with the former restaurateur Jamie Oliver, for example, claiming that 'these drinks are turning our kids into addicts' (Phillips 2018).

In 2018, largely in response to Mr Oliver's campaign, many supermarkets voluntarily banned the sale of energy drink to people under 16. In doing so, they lost sales to independent retailers and now hope to use the law to constrain the competition. The UK government's public consultation recognises that there have been 'strong calls' for legislation from 'some industry bodies and retailers' and argues that a ban 'would create a level playing field for businesses' (DHSC 2018: 6). This suggests an element of rent-seeking by the larger operators which should be resisted.

Society accepts a greater degree of paternalism towards children than towards adults, but this does not give the government *carte blanche*. Age restrictions are generally placed on the sale of products that can cause demonstrable harm to the user (e.g. alcohol, tobacco, solvents) or to others (e.g. knives, fireworks). Neither caffeine nor sugar are age restricted because the potential for harm to the user is so small. Banning the sale

of energy drinks to minors on the basis of their sugar and/or caffeine content would set a troubling precedent. It would be no surprise if, having secured legislation, campaigners complain about the 'loophole' that allows adolescents to buy drinks that contain more sugar or caffeine than those which had just been banned.

A ban would affect adults as well as children. If it goes ahead, anyone who does not look well over the age of 18 will have to provide ID when buying an energy drink. If the government also proceeds with its proposal to ban the sale of energy drinks in vending machines and from certain buildings, it will reduce consumer choice for adults and children alike.

The government has never explained why, if it is appropriate to ban the sale of energy drinks to minors because of their (sometimes) high sugar content, it is not banning the sale of other food and drink products which have more sugar in them. Nor has it explained why, if it is appropriate to ban the sale of energy drinks to minors because of their caffeine content, it is not banning the sale of other similarly caffeinated beverages to minors.

This paper concludes that a ban on the sale of tea, coffee and sugary products to teenagers would be illiberal and disproportionate. There is no scientific reason to view a ban on the sale of energy drinks to teenagers any differently.

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