

High flavoring content in some e-cigarettes may be cause for concern

April 15 2015



A photo of 117mm e-cigarette. Image: Wikipedia.

The levels of chemicals used to flavour some brands of e-cigarette fluid exceed recommended exposure limits and could be respiratory irritants, in some cases, suggests research published online in the journal *Tobacco Control*.

The electronic cigarette market has developed rapidly in recent years, with [global sales](#) in 2014 estimated to be in the region of US\$7 billion, but the [health implications](#) of vaping remain hotly contested.

Artificial and other flavourings in e-cigarettes are mostly the same as those used in food and confectionery manufacture, and are therefore often represented as safe by e-cigarette manufacturers.

But as the US Flavor Extracts Manufacturers Association (FEMA) has pointed out, this safety relates to exposure through eating, and not inhalation. And the ingredients listed on the product labels for e-cigarettes rarely include the chemicals used for flavouring.

The researchers therefore set out to find out the levels and type of chemicals used to flavour e-cigarette fluid in a sample of 30 products.

These included two single use disposable brands in five different flavours of tobacco, menthol, vanilla, cherry and coffee; the same flavours in refill bottles; and additional flavours of chocolate/cocoa, grape, apple, cotton candy and bubble gum in refill bottles.

The flavouring chemicals totalled more than 1% by volume in 13 of the 30 liquids analysed, levels greater than 2% by weight in seven liquids, and levels greater than 3% by weight in two products.

Seventeen of the products contained the same vanillin or ethyl vanillin flavourings, suggesting that a small number of chemicals are particularly popular with manufacturers and users.

And many of the 'tobacco' flavoured fluids contained chemicals used to flavour confectionery.

Six of the 24 compounds revealed in the analyses were aldehydes, compounds recognised to be primary respiratory irritants.

Using a consumption rate of around 5 ml/day, as commonly reported on online vaping forums, vapers would be exposed to twice the recommended occupational [exposure limits](#) of benzaldehyde and vanillin with the products tested, say the researchers.

"And toxic degradation products may be produced by reaction of the

flavour chemicals at the high temperatures present during vaping," they caution.

They admit that their sample represents a fraction of the e-cigarette products on the market.

But they say: "Nevertheless, the results obtained are likely to be similar to what a broad survey would have revealed, and in any case, suggest that very high levels of some flavour chemicals are undoubtedly present in a great number of the thousands of products currently available."

Regulations are needed, they argue. These should include compulsory ingredient listing, limiting the levels of certain flavourings, and limiting the total permissible levels of flavourings, particularly as there is some concern that flavoured products might make e-cigarettes more attractive to young people, they suggest.

More information: Flavour chemicals in electronic cigarette fluids, *Tobacco Control* , [DOI: 10.1136/tobaccocontrol-2014—052175](https://doi.org/10.1136/tobaccocontrol-2014-052175)

Provided by British Medical Journal

Citation: High flavoring content in some e-cigarettes may be cause for concern (2015, April 15) retrieved 17 July 2024 from <https://medicalxpress.com/news/2015-04-high-flavoring-content-e-cigarettes.html>

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