Correction: *Did JUUL alter the content of menthol pods in response to US FDA flavour enforcement policy?*

Yassine A, El Hage R, El-Hellani A, *et al*. Did JUUL alter the content of menthol pods in response to US FDA flavour enforcement policy? *Tob Control* 2022;31:s234–s237.

1. The title of the paper has been updated to *Levels of menthol, nicotine and cooling agents measured in JUUL products purchased across a three-year period*.
2. The abstract and body of the paper have been re-worded to remove any reference to alteration of pod ingredients by JUUL as shown below in detail.

ABSTRACT

Replaced text

Original: This study highlights how regulations intended to reduce e-cigarette prevalence among youth may influence changes in tobacco product characteristics in ways that regulations may not have foreseen.

Revised: This study shows that concentrations of nicotine and menthol in JUUL products procured over a 3 year period decreased over time. The findings highlight the challenges of reconstructing product characteristics at the time of manufacture and time of consumption, and suggests the utility of an ENDS product bank that could preserve samples for retrospective studies. They also underscore that manufacturers should be required to release to the public and the scientific community what they know about time- and temperature-dependent degradation of their products.

WHAT IS ALREADY KNOWN

Replaced text

Original: This study sought to examine whether JUUL's liquid formulations changed in the years surrounding the flavour restriction.

Revised: This study examined liquid formulations of JUUL menthol and mint products in the USA prior to and after the FDA enforcement policy.

WHAT THIS STUDY ADDS

Added text

- Menthol- and Cool Mint JUUL pods contained similar amounts of menthol in a given year.
- Cool Mint JUUL pods contained additional cooling agents and other flavorants not found in the Menthol pods.

Replaced text

Original: Following the enforcement policy, tested samples of JUUL menthol pods had significantly greater menthol content than the pre-restriction products.

Revised: The 2020 Menthol JUUL pods contained significantly greater nicotine and menthol than the 2017 and 2018 pods.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

Removed text

Menthol and other coolants in e-cigarettes should be target for regulation.

Added text

Nicotine and menthol concentrations in a given ENDS product may change with time.

INTRODUCTION

Removed text

In this study, we sought to examine whether JUUL's liquid formulations changed in the years surrounding the flavour enforcement policy.

DISCUSSION

Replaced text

Original: In this work, we quantified menthol and nicotine levels in JUUL pods purchased in the year surrounding the FDA flavour enforcement policy of February 2020.

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Revised: In this work, we quantified menthol and nicotine levels in JUUL pods purchased across a 3 year period.
Original: Our data show that JUUL Menthol pods, procured in May 2020, exhibited higher menthol concentrations than all the test products purchased before the enforcement policy.
Revised: Our data show that JUUL Menthol pods, procured in May 2020, exhibited higher menthol concentrations than the tested products purchased in 2017 and 2018.

Removed text

These findings therefore suggest that JUUL's menthol content increased following the FDA flavour enforcement policy, and that nicotine content may vary by product even when the label indicates the same 5% concentration. That the Cool Mint pods contained as much menthol as the Menthol pods highlights that manufacturer market flavours under different labels and may explain why previous users of Cool Mint found Menthol pods similarly satisfying.

Added text

We also found that Cool Mint contained at least ten constituents not found in the Menthol product, including several flavorants and cooling agents.

Replaced text

Original: One limitation of this study is that we did not have information on the production dates of the products; what we procured from store shelves in May 2020 might have been from stocks shipped before the enforcement policy. Nonetheless, the difference in menthol content across products is clear, and manufacturers may adjust liquid composition in anticipation of enforcement policies.
Revised: One limitation of this study is that product differences across year of purchase may reflect product degradation during storage rather than a different formulation.

Removed text

The array of compounds that impart a cooling sensation found in JUUL pods suggests that industry may readily circumvent regulations if the later focus narrowly on menthol.

Replaced text

Original: In conclusion, our findings suggest the possibility that the menthol content of JUUL pods changed in a manner that may have increased the appeal of these products when other flavoured pod- based products were no longer available. This work highlights the need to consider menthol and other natural and synthetic coolants in e- cigarettes as a possible target for regulation, as well as the need for regular independent testing to assure that products remain compliant with regulation.
Revised: This study shows that concentrations of nicotine and menthol in JUUL products procured over a 3 year period decreased over time, possibly due to product degradation during storage. The findings highlight challenges of reconstructing product characteristics at the time of manufacture and time of consumption, and suggests the utility of an ENDS product bank that could preserve samples for retrospective studies.

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Tob Control 2024;**33**:e1. doi:10.1136/tobaccocontrol-2022-057506corr1

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