

Supplemental Table 1– Product Label and Flavoring Chemical Comparisons in Specific Brand and Flavors Collected Pre- and Post-ban

Brand – Flavor (n=pre-ban n=post-ban)	Label (Pre and Post) 1	Average # Flavorings (±SD ²)		Average Concentration (mg/mL) (±SD)															
				Benzalde- hyde		Benzyl Alcohol		Ethyl Maltol		Ethyl Vanillin		Furaneol		Maltol		Menthol		Vanillin	
				Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban	Pre- ban	Post- ban
E-Cigarette Refill Solutions																			
Yeti Vape – Beast Cake (n=1 n=8)	Same	17.0 +	10.9 (9.0)	---	---	---	---	0.9 +	0.8 (0.1)	---	---	---	---	1.4 +	1.2 (0.1)	---	---	2.7 +	1.0 (0.2)
Yeti Vape – Crunchy Black (n=1 n=3)	Same	22.0 +	20.7 (5.5)	---	---	---	0.2 (0.1)	1.0 +	2.6 (0.0)	---	1.9 (0.1)	---	---	1.4 +	---	---	---	2.9 +	1.9 (0.1)
Yeti Vape – Chupacabra (n=1 n=2)	Same	17.0 +	14.0 (11.3)	---	---	---	---	1.1 +	1.1 (0.0)	0.4 +	0.4 (0.0)	---	---	---	---	---	---	6.3 +	6.1 (0.6)
Yeti Vape – Strawberry Fields (n=1 n=1)	Same	9.0 +	8.0 +	---	---	---	---	---	---	---	---	---	---	1.1 +	1.1 +	---	---	---	---
Prohibition Juice Co. – White Lightening (n=1 n=8)	Same	13.0 +	7.4 (6.2)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7 Daze – Watermelon (n=6 n=6)	Diff. Design Only	26.8 (1.7)	20.8 (10.4)	0.1 (0.0)	0.1 (0.1)	---	---	---	---	---	---	0.04 (0.0)	0.04 (0.0)	---	---	---	---	---	---
Twist – Iced Pink Punch (n=5 n=3)	Same	10.8 (6.0)	4.7 (0.6)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Air Factory – Blue Razz ³ (n=1 n=4)	Same	4.0 +	10.5 (4.4)	---	---	0.5 +	0.7 (0.2)	---	---	---	---	---	---	---	---	0.4 +	---	---	---
Juice Head – Watermelon Lime (n=4 n=1)	Diff. Design Only	10.5 (6.1)	10.0 +	---	---	---	---	---	---	---	---	0.3 (0.2)	0.06 +	---	---	---	---	---	---
Juice Head – Blueberry Lemon (n=2 n=3)	Diff. Design Only	25.0 (1.4)	5.0 (1.7)	---	---	1.5 (0.0)	0.8 (0.0)	---	---	---	---	---	0.2 (0.1)	---	---	---	---	---	---
Ripe – Kiwi Dragon Berry	Same	20.3 (9.1)	17.0 +	---	---	1.2 (0.9)	0.5 +	---	---	---	---	---	---	2.3 (0.0)	1.0 +	---	---	---	---

(n=3 n=1)																					
Keep It 100 – Pink Burst (n=2 n=2)	Same	26.0 (1.4)	13.5 (3.5)	---	---	0.8 (0.1)	0.4 (0.3)	0.7 (0.0)	1.0 +	0.7 (0.3)	1.1 (0.2)	0.4 (0.0)	0.2 (0.1)	---	---	---	---	0.9 +	1.0 (0.1)		
Wet Liquids – Watermelon Apple (n=2 n=2)	Same	16.0 (1.4)	8.0 (11.3)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Pod Juice – Cotton Burst (n=1 n=1)	Same	3.0 +	22.0 +	---	---	---	---	14.4 +	16.4 +	1.6 +	1.0 +	---	---	---	---	---	---	---	---		
Cloud Nurdz – Peach Blue Raspberry (n=1 n=1)	Diff. Design Only	5.0 +	6.0 +	---	---	0.1 +	0.2 +	---	---	---	---	---	---	---	---	---	---	---	---		
Pod Systems																					
Hyde – Lush Ice (n=6 n=6)	Differ	7.2 (2.9)	10.3 (1.8)	---	---	---	---	0.9 (0.3)	0.9 (0.1)	---	---	---	---	---	---	---	---	0.3 (0.2)	0.2 (0.1)	---	---
Hyde – Pineapple Ice (n=2 n=5)	Differ	3.5 (2.1)	5.2 (3.0)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Hyde – Pink Lemonade (n=2 n=2)	Differ	2.5 (0.7)	4.5 (2.1)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
JUUL – Menthol (n=2 n=6)	Same	3.0 (0.0)	2.5 (2.1)	---	---	0.02 +	0.02 +	---	---	---	---	---	---	---	---	---	---	0.2 +	0.5 +	---	---

--- refers to detections below lower limit of quantitation (LLOQ). LLOQ (mg/mL) values for the eight flavoring chemicals are: benzaldehyde = 0.02, benzyl alcohol = 0.02, ethyl maltol = 0.6, ethyl vanillin = 0.3, furaneol = 0.2, maltol = 0.6, menthol = 0.1, vanillin = 0.6.

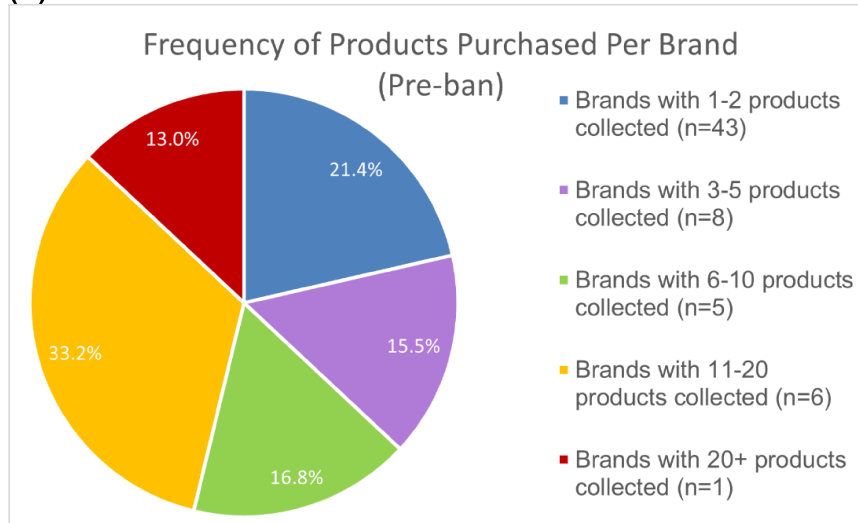
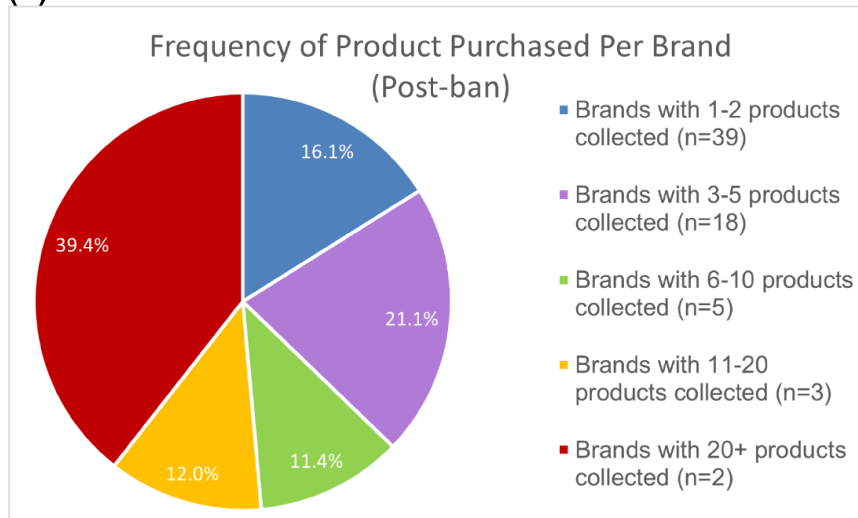
¹Pre and Post ban product labels are either identical (same), different in design only (flavor descriptors unchanged), or differ substantially.

²SD = standard deviation

³Menthol was identified in a pre-ban product labeled with an additional “Ice” flavor descriptor. Other “Blue Razz” products from Air Factory did not make this distinction.

+Chemical detected in one replicate only. Standard deviation (SD) not calculated

Statistical comparisons not performed due to low sample numbers

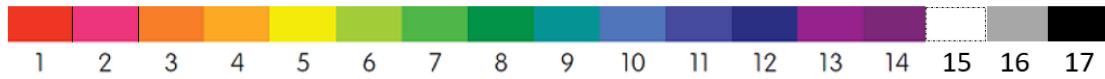
Supplemental Figure 1 – Frequency of Brands Purchased Pre- and Post-ban**(A)****(B)**

Supplemental Analysis 1:

Product Review: Three reviewers independently analyzed images for all pre- and post-ban products included in the study analysis. Traits of interest are listed in the table below (**Table S1**, below), as are the closed survey questions for each. Three independent reviewers recorded pre-defined responses or selected the closest color matching the color scale (**Figure S1**, below). A fourth, independent validator reviewed responses. For color responses, selections were condensed into the following: 1-5 = Group 1, 6-9 = Group 2, 10-12 = Group 3, 13,14 = Group 4, 15-17 & N/A = Group 5. Validation of the questionnaire was performed using Fleiss' kappa for multiple raters, which determined moderate agreement. Final responses for each image were determined as the majority response (2 or more raters agreed). In cases where no responses matched, the independent validator reviewed these images and selected the most appropriate response. In each product trait assessment, this equated to fewer than 5% of responses.

Table S1 – Laboratory Developed Product Assessment Questionnaire

Product Trait Assessment					
	Flavor Descriptor		Colors		Graphics
Location of Trait on Vaping Product (Figure S2, below)	1	2	3	4	5
Survey Question	What type of descriptive language is used to convey flavors other than tobacco?	What is the primary color of the label?	What is the primary color of the bottle?	Is the graphic representative of a flavor, either expressed or implied, other than tobacco?	What is the primary color of the graphic?
Closed, Selectable Responses:	1.Expressed 2.Implied 3.N/A or No 4.Image Unclear	1.Select closest color from color scale below 2.N/A or No 3.Image Unclear	1.Select closest color from color scale below 2.N/A or No 3.Image Unclear	1.Expressed 2.Implied 3.Not specific to a flavor or N/A 4.Image Unclear	1.Select closest color from color scale below 2.N/A or No 3.Image Unclear
Fleiss' Kappa (κ) – Pre-ban	0.53 (95% CI: 0.48, 0.58)	0.63 (95% CI: 0.56, 0.70)	0.74 (95% CI: 0.67, 0.81)	0.60 (95% CI: 0.54, 0.65)	0.83 (95% CI: 0.76, 0.91)
Fleiss' Kappa (κ) – Post-ban	0.71 (95% CI: 0.67, 0.76)	0.49 (95% CI: 0.42, 0.55)	0.89 (95% CI: 0.83, 0.96)	0.65 (95% CI: 0.60, 0.70)	0.80 (95% CI: 0.73, 0.86)
≥ 2 matching responses (Pre-ban)	95.8%	96.2%	99.2%	94.1%	97.5%
≥ 2 matching responses (Post-ban)	95.3%	95.9%	99.4%	95.6%	99.7%

Figure S1 – Laboratory Developed Color Scale

Definitions of closed selectable answers and other vocabulary:

- Expressed – the language used on the label explicitly says the product is a flavor other than tobacco. You know what the e-liquid will taste like. e.g., “Strawberry”, “Grape”, etc.
- Implied – the language used on the label implicitly says the product is a flavor other than tobacco. You can’t be sure what the e-liquid will taste like, but it is not likely tobacco. E.g., Fairy dust, unicorn blood, etc.
- Primary color – the most prominent color displayed. The color that catches your eye first.

Figure S2 – Product Image Example

Data analysis: Results were numerically coded for statistical comparisons. For all color comparisons, Groups 1-4 were coded as colored, while Group 5 was coded as not colored.

For Flavor Descriptor and Graphic Descriptor analyses, results were imputed as four comparative responses (none=0, expressed = 1, implied = 2, and unclear = 4) and chi square tests were performed for “expressed”, “implied” and “none” descriptors. For color comparisons, results were imputed as binary comparisons (colored=0, not colored=1). Results for colored only have been reported in **Table 1** in the main manuscript.

Supplemental Analysis 2:

Qualitative identification of flavoring chemicals in each liquid was performed on an Agilent 7890B/5977A GC/MS with a DB-624 UI (30 m, 320 μm ID, 0.25 μm film thickness) analytical column. For analysis prior to June 7th, 2021, 1 μL of each solution was injected into 250°C, without splitting the volume during injection (splitless). Initial oven temperature started at 50°C, held 2 min and then ramped to 240°C at 10°C/min and held 10 min. Helium pressure through the column was constant at 18.7 psi. After June 7th, column parameters were adjusted after installation of a capillary flow splitter with 2.2 m of inert 150 μm ID capillary column leading into the MS. Here, 1 μL of each solution was injected into 250°C, without splitting the volume during injection (splitless). Initial oven temperature started at 50°C, held 2 min and then ramped to 240°C at 10°C/min and held 14 min. Helium pressure through the analytical column was constant at 35.7 psi and constant pressure at 22.9 psi through the inert capillary column. Transfer into the MS was at 250°C. Acquisition of mass spectrum in all analyses was performed in scan mode and positive ionization, with source and quadrupole temperatures of 230°C and 150°C, respectively, recording masses between 30 and 300 amu. Data was acquired for 31 min (prior to June 7th) or 35 min (after June 7th). Peak extraction was performed in Agilent Unknowns software (v10.2) using proprietary deconvolution processes and an area threshold of 400,000 counts. Resolved peaks were then tentatively identified by comparing mass spectra to spectral libraries prioritized in the following order 1. laboratory-derived containing 80 compounds with known spectrum and retention times, 2. Flavors and Fragrances of Natural and Synthetic Compounds (FFNSC, 3rd edition, Mondello, Wiley, Hoboken, NJ) and 3. 2017 NIST Mass Spectral Search Program (NIST17, v2.3, NIST Mass Spectrometry Data Center, Gaithersburg, MD). A match factor threshold of 70 was used for identifications. Alignment of identified chemicals by CAS number and retention times was performed in Agilent Mass Profiler Professional (MPP) software, which provided a working list of unique chemical identifications for each vaping product. Chemicals were retained in the final data set if identified at a minimum of two out of the three replicates for each liquid. Flavoring chemicals specifically were determined by matching CAS numbers to known taste and/or odor descriptors using an online flavoring database ([The Good Scents Company Information System](#)). Chemicals with flavor descriptors not considered to be vaping flavor additives (e.g., toluene) were excluded. Propylene glycol and vegetable glycerin, while associated with a flavor, were also removed.