Feeling the Heat: Impact of Chemicals on the Temperature of Vape

Blach, Shelby (School: Yuma High School)

Vaping is a process of inhaling and exhaling an aerosol using some type of vaping device. Vaping has become very popular among people, especially teens. Propylene glycol (PG) and vegetable glycerin (VG) are two main chemicals found in vape. Common vape flavorings include Diacetyl (DA) and menthol, which creates a buttery flavor and a minty flavor; respectively. The researcher wanted to determine the temperature at which the vape is released and temperatures that various parts of the upper respiratory system might be exposed to. It was hypothesized a significant temperature difference would be found at each of the three designated locations. Three temperature probes were installed in an experimental chamber to determine how the temperature of the vape changed once released. Twenty concentrations of different chemicals were tested. Each concentration consisted of 10 trials. The mean maximum temperature was calculated for each probe for each trial. For probe 1 the site where vape is released (which represented the lips), the temperature did increase, but not significantly; therefore the hypothesis was rejected. However, for probes 2 and 3, which correlated with the pharynx and trachea; respectively, the temperature changes experienced were statistically significant at the 95% confidence interval. For example for the PG trials, Probe 2 experienced a temperature increase of 24.57°C and Probe 3 experienced an increase of 10.31°C, which were both statistically significant; whereas Probe 1 only saw a temperature increase of 4.71°C, which was not statistically significant.

Awards Won: