



“Breath Happy”, without Febreze

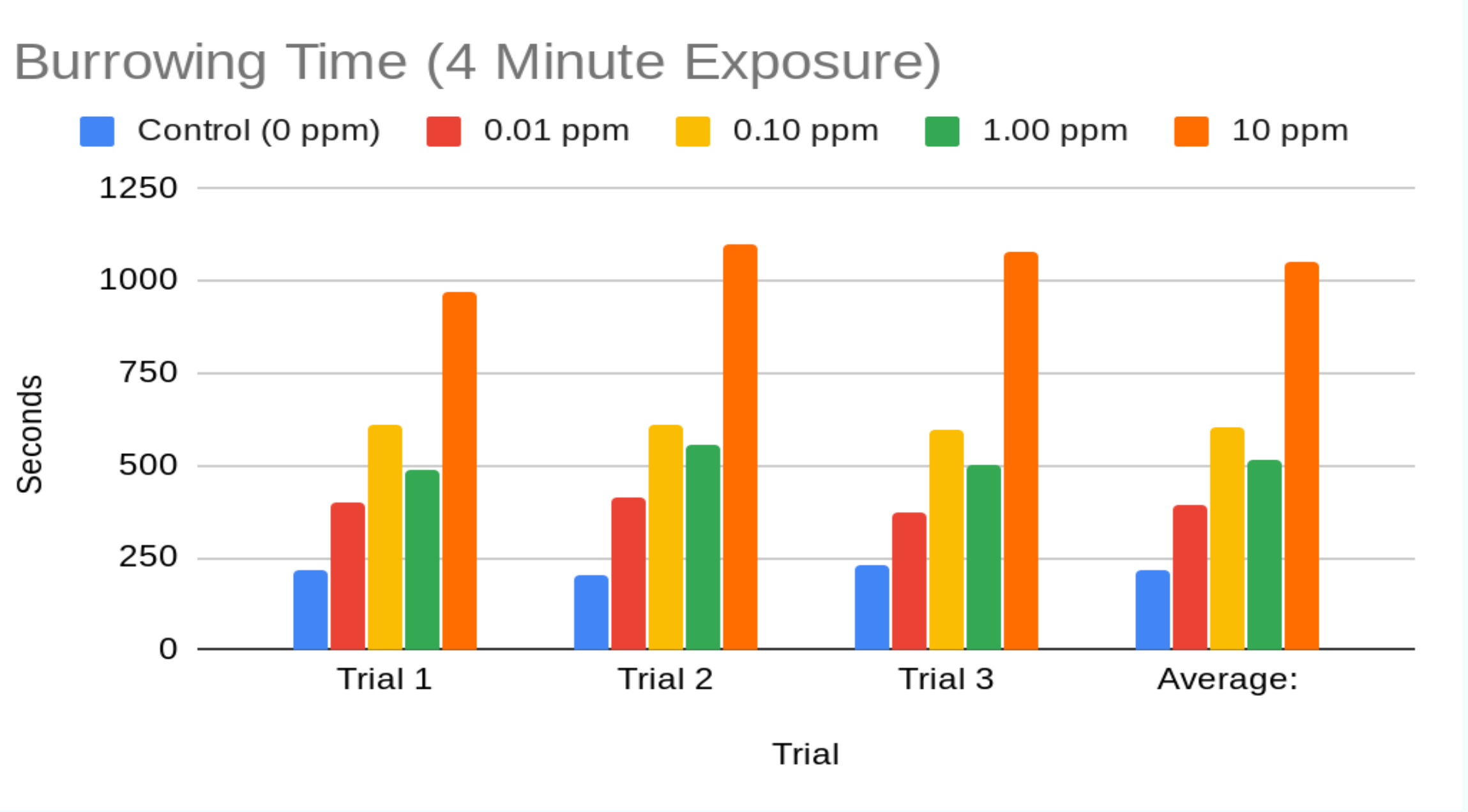
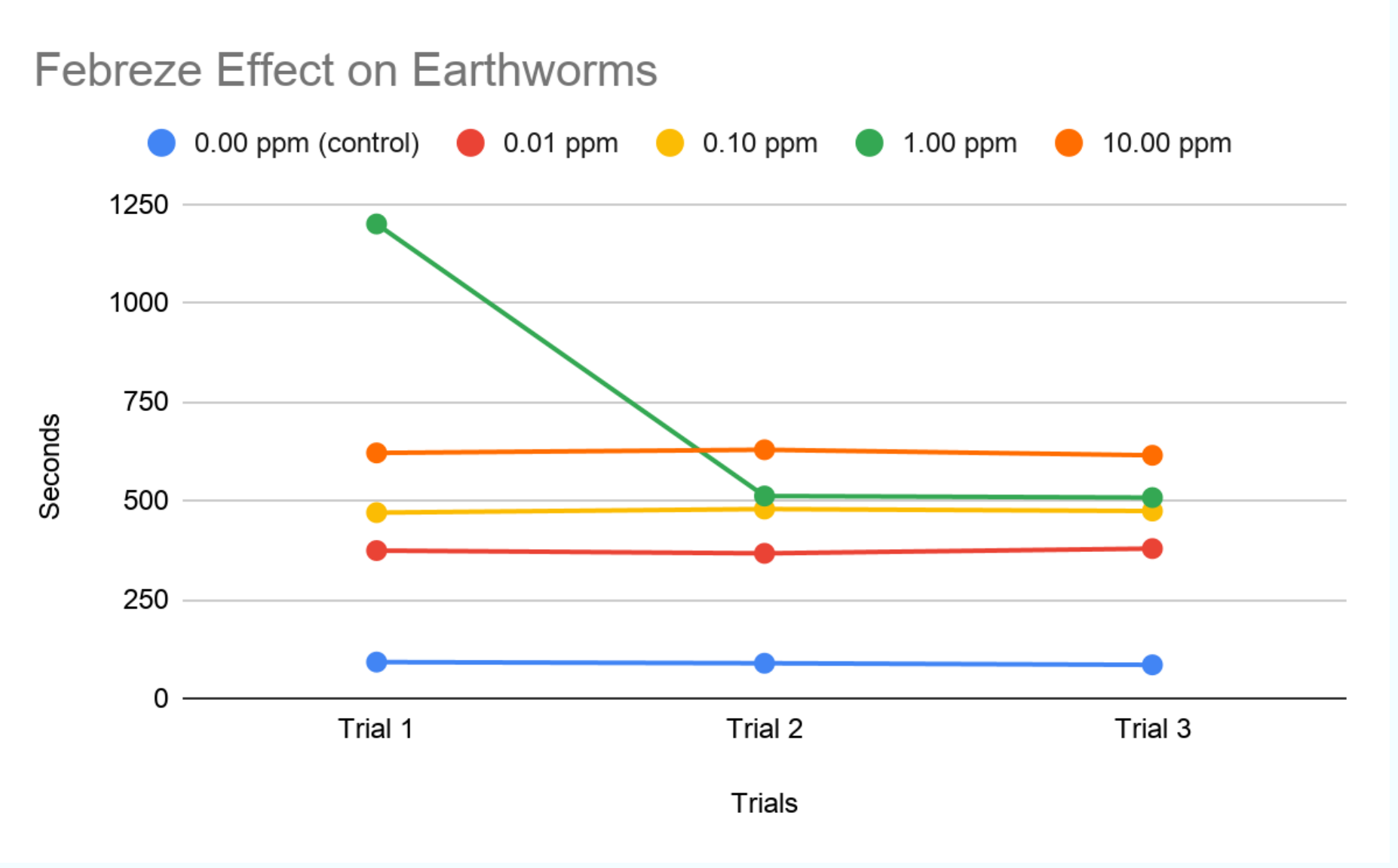
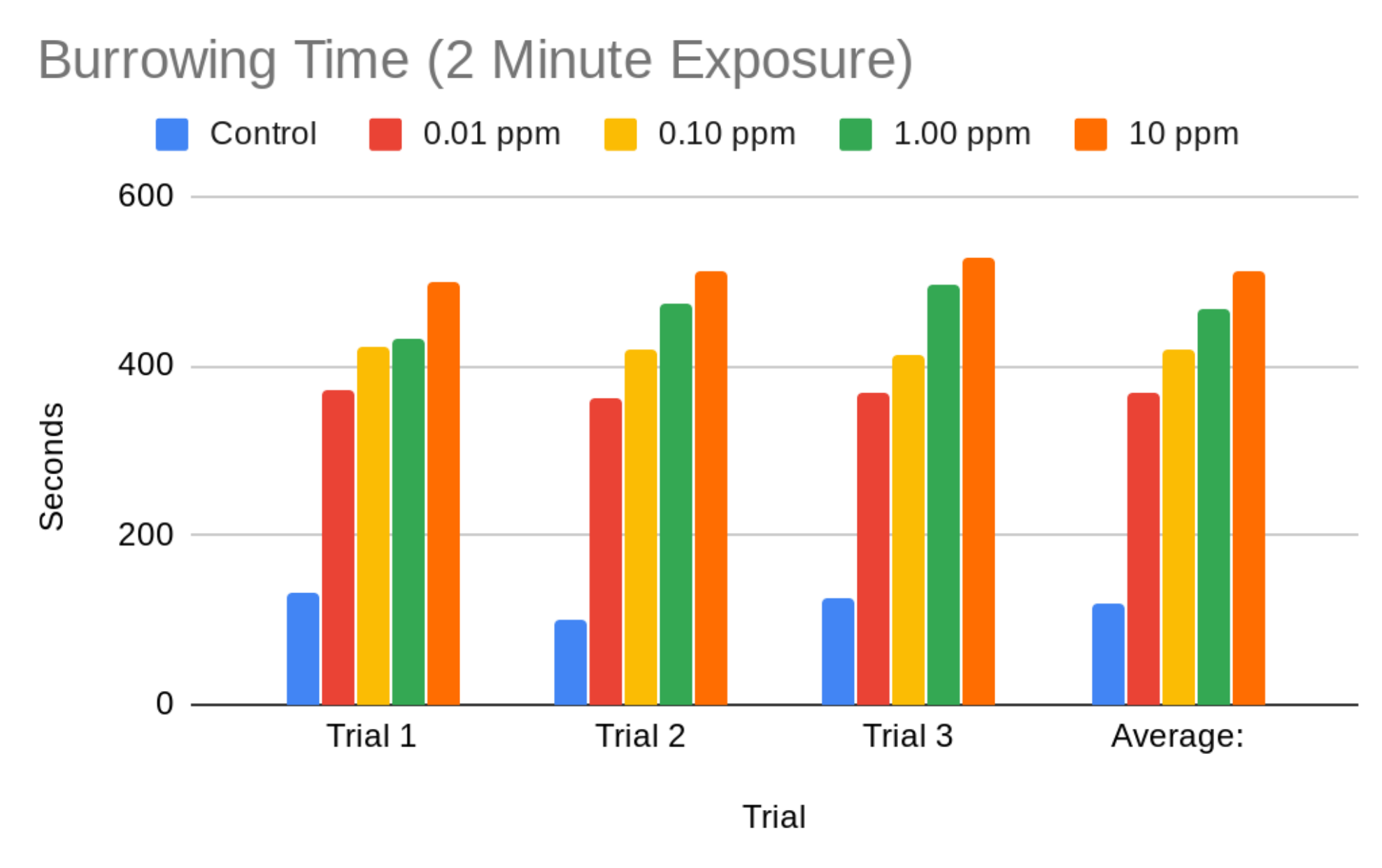


By: Elle Brunner and Emery Cummins-Brown

Abstract: This research paper includes the findings surrounding the question “does Febreze affect the burrowing time of earthworms?” In this experiment, scientists Emery Cummins-Brown and Elle Brunner created an experiment to test the effects of Febreze on earthworms. The scientists decided to test Febreze because it is a very commonly used product in many places all around the globe. The scientists hypothesized that as the 100%stock solution of Febreze increased, so would the burrowing time of the earthworm. To test this hypothesis, the scientists used an exposure chamber, then moved the worms to the burrowing chamber to record their behaviors and burrowing times. As the scientists hypothesized, as the exposure time increased, so did the time it took for the earthworms to burrow. They chose earthworms to test because of their similar nervous systems to humans. Some of the effects of these dangerous chemicals in Febreze include asthma, neurotoxicity, hormone disruption, cancer in some animal studies, and reproductive toxicity. These are the reasons why the scientists chose to test and research Febreze.

Materials and Methods: Place nine drops of water to one drop of febreze. This is a 100% stock solution. Dilute this to make a 10%solution. Then make 15 ML of the 10%stock solution and add to cup. In another cup, add 1 cup of potting soil. Doing the following quickly, add three worms to the cup with the solution and put one coffee filter circle on top of them. Put the last cup without the dirt in it on top of the coffee filter so that the worms get pressed to the bottom of the cup. Start a timer for 2 minutes. After the two minutes are up, put the three worms in the soil and start three new timers. Once you can’t see the worms’ tail in the dirt, stop the timer. Then use three worms and instead of keeping them in the exposure chamber for two minutes, keep them in for three minutes. After, repeat and keep new worms in the exposure chamber for 4 minutes. Repeat these steps for the control, 1% 10%, and 100% stock solution.

Results: The result of the experiment was that all the data was statistically significant.. The reason the scientists did this experiment was to see how Febreze effected an earthworm. Also, since earthworms have similarities to humans, people can see how it could possibly affect humans. Their hypothesis was that if the concentration of the Febreze solution increased, the time it took for the earthworm to burrow increased. The trend shows an increase in burrowing time for each concentration. Due to limited time testing was only completed throught 0.01% Overall, the burrowing time increased except for one point.



Introduction: Febreze is used to take odor away from your clothes or to make it not smell as bad. It has over 86 ingredients but the company only labeled three! Some of the ingredients are toxic and three can cause cancer. Some ingredients like fragrances, Sodium Polyacrylate, Dialkyl Sulfosuccinates, and many others can cause allergies like rash, itchy eyes, and asthma. If you inhale air fresheners as little as once per week, you can increase the risk of asthma by 71% According to the NHCS (national consumer survey) in 2019 42.76 million Americans reported using 6 cans or more of air freshener. Febreze is everywhere. It can be in any bathroom, even your house! Because of these adverse effects, two scientists felt that it was important to complete an investigation on how febreze effects an earthworm burrowing time. If scientists put earthworms in certain dilutions of febreze, then as the concentration of febreze gets higher, the earthworms burrowing time takes longer.

Discussion: Since Febreze contains toxic chemicals that can result in asthma, neurotoxicity, hormone disruption, cancer in some animal studies, and reproductive toxicity, those effects could have been a potential reason for the earthworms behavior and reaction to the contaminant. Any amount of a chemical has the ability to be detrimental to your health. The difference of just the 0.01 ppm to the control is massive, proving that even trace amounts of Febreze can negatively affect the earthworms burrowing patterns. Through this experiment, people are now able to get a glimpse into what can happen to your body first hand when exposed to Febreze. If the results are as drastic as they are tested on earthworms, imagine the effects of Febreze on the human body. This information could potentially reduce the number of people prone to suffer with asthma, neurotoxicity, hormone disruption, cancer in some animal studies, and reproductive toxicity, as a result of usage of Febreze. By informing consumers with the knowledge of the effects Febreze on earthworms, that allows the consumer to make an educated decision when knowing the potential risks on humans when deciding to use this product. This experiment brought forth some important topics that could potentially bring some light to the harmful ingredients inside of odor removal products, and the prominent effects when using.

Works Cited: “All You Need to Know: Febreze.” *Air Fresheners & Odor-Eliminating Products*, www.febreze.com/en-us/safety/febreze-safety.

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