



# Energy Drinks, A Monster in Disguise



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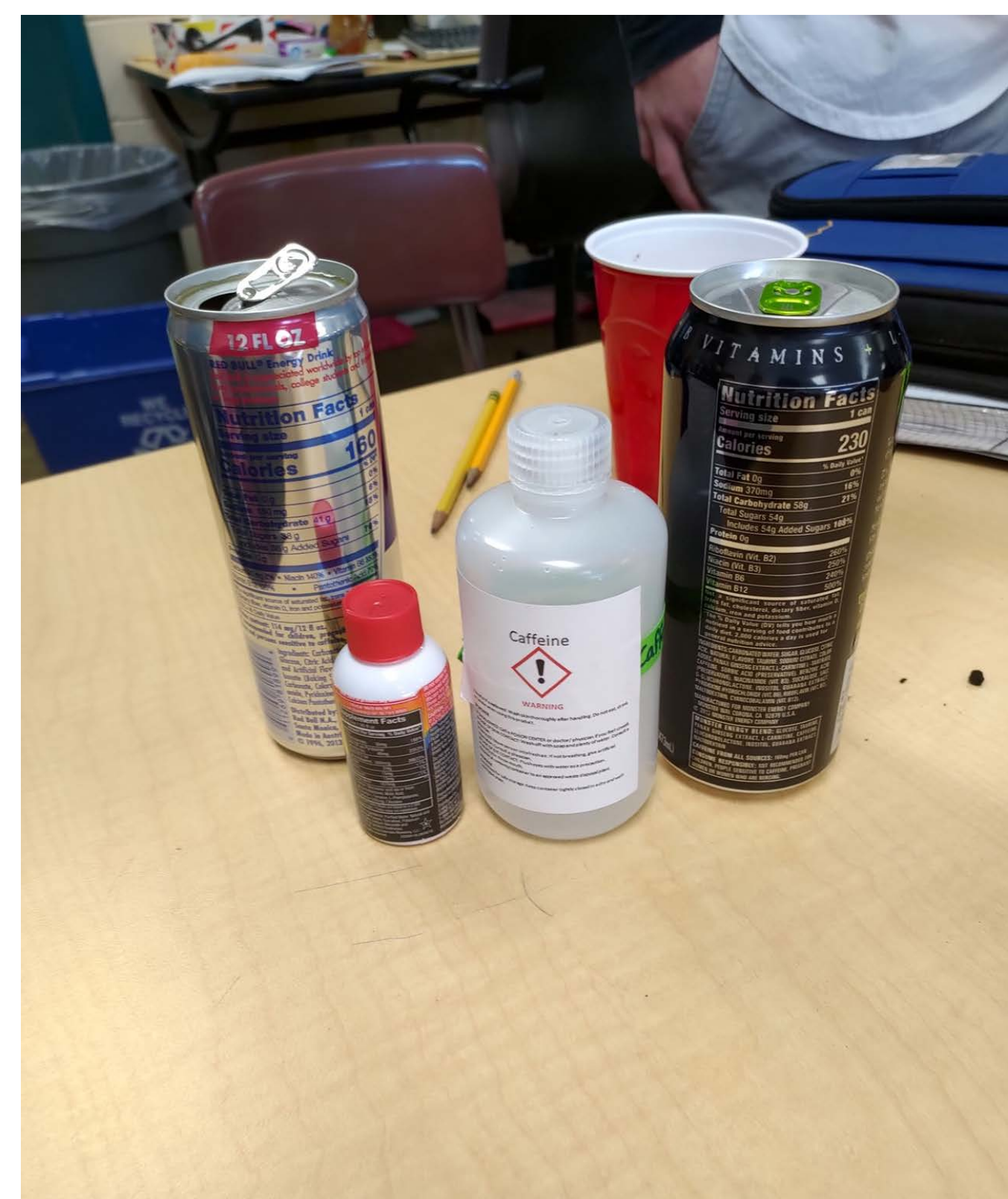
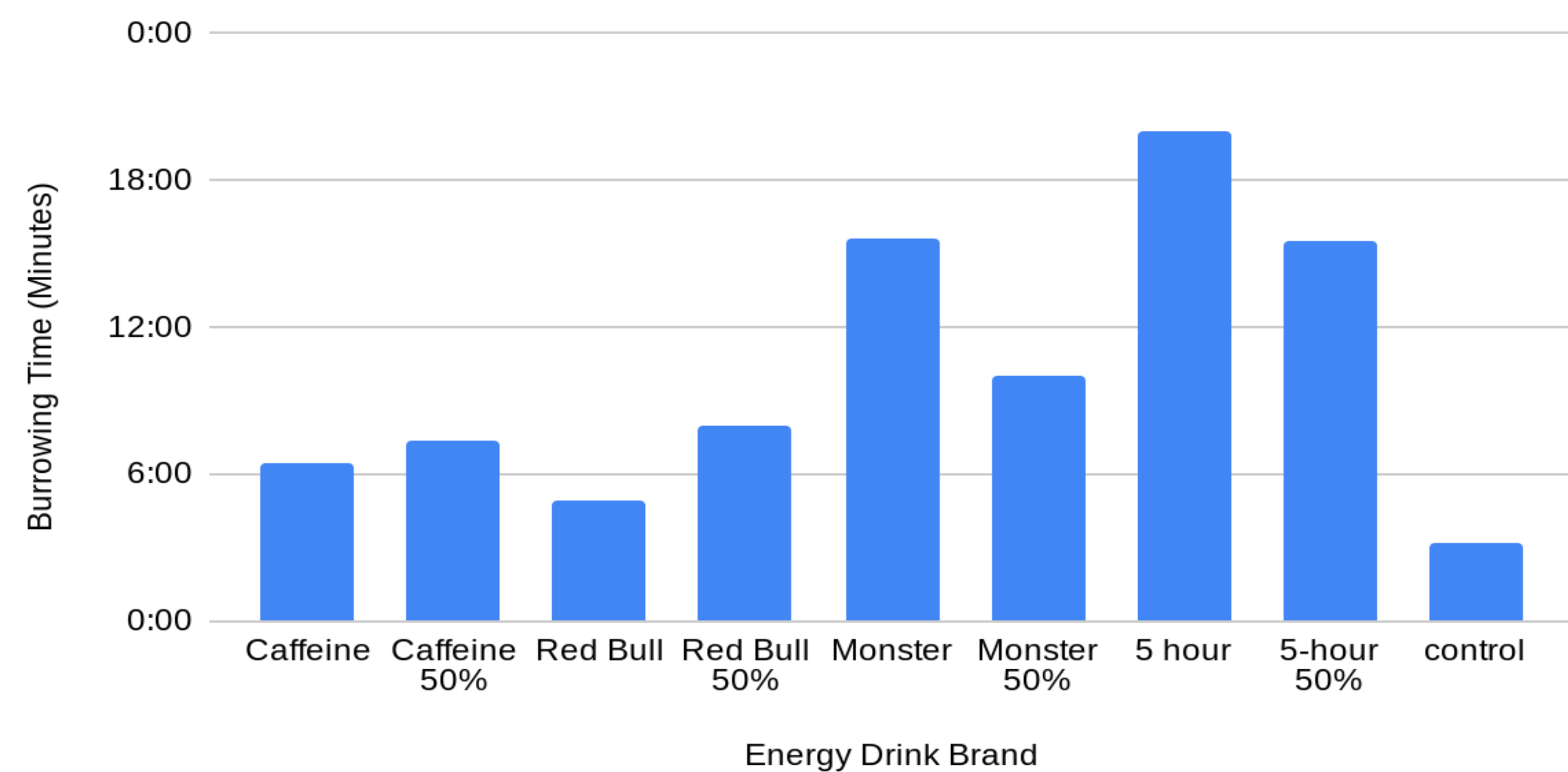
**Abstract:** Since energy drinks have killed many people over the years ( about 34 deaths in 2011 ) three scientists tested if energy drinks would effect an earthworms burrowing time by conducting an experiment. From research they found many chemicals inside energy drinks that may be harmful to humans. The scientists used Monster, 5-hour energy, a caffeine solution and Red Bull to test on the worms. They then timed the burrowing time to see the effects of the caffeine. The worms took longer to burrow when exposed to energy drinks. With the control taking on average 3 minutes for the worms to burrow and the 5-hour, which was the most effective taking over 20 minutes for the worms to burrow.

## Materials and Methods:

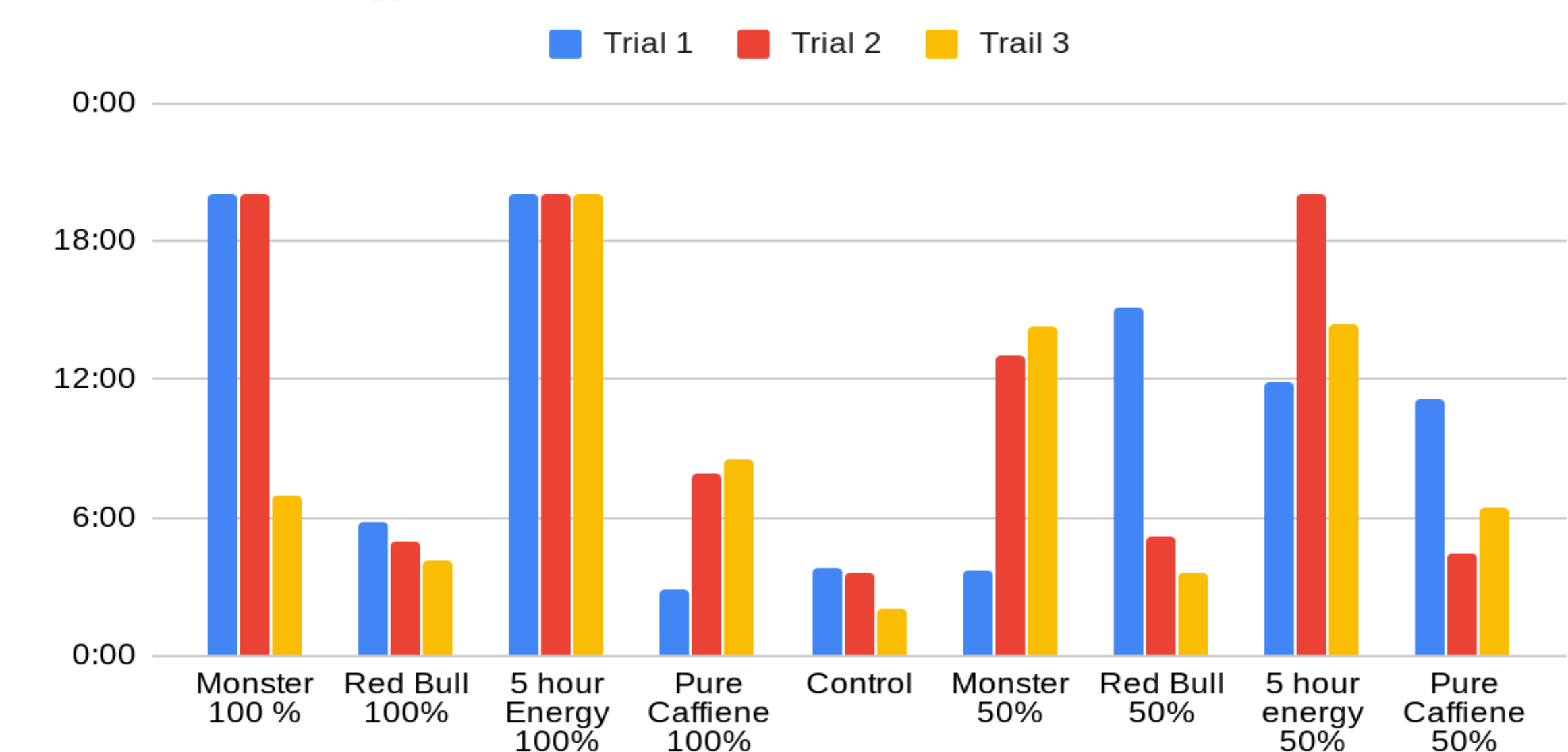
To complete the experiment the scientists took one adult redworm and placed it in an exposure chamber which they made by filling the cup with the contaminant until the contaminant was over the top of the bottom of the cup and placed a coffee filter on the top of the cup and placed the redworm on the filter and another filter and cup on the worm. They exposed it for 20 minutes and recorded the time it took the worm to burrow.

**Introduction:** People of many ages consume energy drinks. This puts a ton of sugar and caffeine into one's body. Energy drinks are easily accessible, so teens and adults are able to be exposed to this harmful drink. Many people consume it on a regular basis and it has had many negative effects including hospitalization and deaths. 3 scientists tested on how energy drinks affect a redworms movement. More specifically it's burrowing time. Using an exposure chamber, they exposed a redworm to the contaminants and then timed the amount of time it took to burrow. The scientists came up with the hypothesis that the burrowing time would increase when the worm was exposed to the energy drink

Burrowing Time (Minutes) vs. Energy Drink Brand



How do Energy Drinks Effect Earthworms?



**Discussion:** As seen from the results, the control was the fastest with an average of 3:11. The 100% concentration 5-hour energy was the slowest with a time of 20+ minutes. Many of the other contaminants took more than 2 minutes longer than the control to burrow. This didn't match with our hypothesis at all. We thought that the burrowing time would go down. The burrowing time actually went up as compared to the control. While working on this experiment the scientists weren't able to get flat bottomed cups that may have caused one area to have more contaminated than another. Also the scientists could have done more trials to get accurate results. After the experiment and research the scientists have realized how much harm energy drinks have done to people. Both the research and the results backed this up.

**Results:** Through testing by an exposure chamber for 20 minutes and timing the burrowing time, the scientists were able to get the final results. While testing they used the energy drinks as their independent variable, then the dependent variable was the burrowing time, and the scientists used an adult worm as their control. They wanted to see how the ingredients in energy drinks affected a worms movement. The scientists used multiple types of energy drinks at 2 different concentrations and got many different times. They found that overall the control was the fastest out of all of them and the 5-hour energy was the slowest. However, the effects of the energy drink varied between concentration and type. All of the energy drinks were statistically significant when compared to the control with most of them being around 1 or 2.

## Sources Cited:

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