

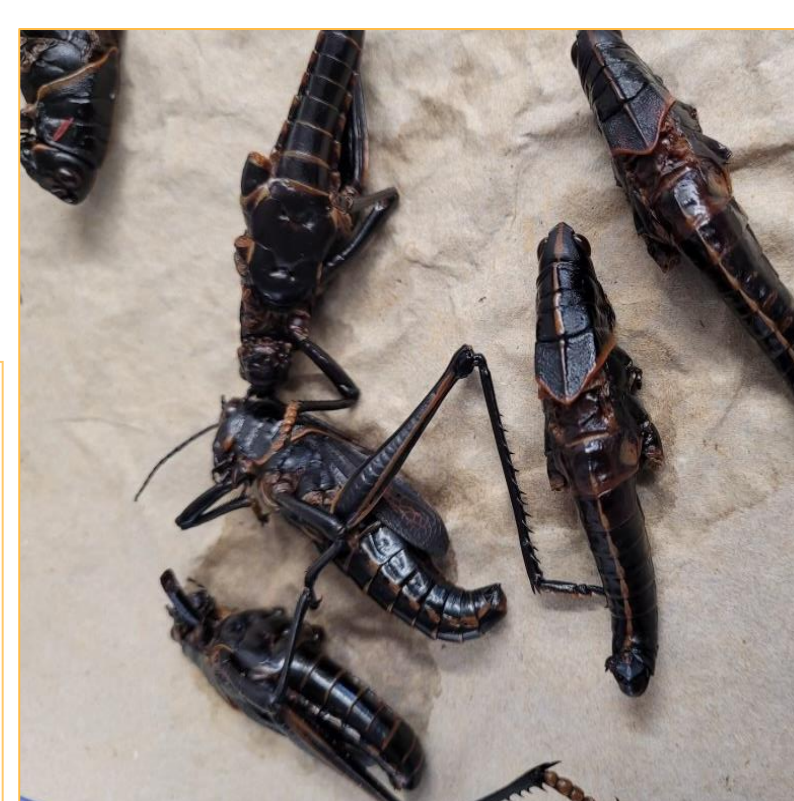
Are Dissections Safe?

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Materials, Procedure, and Variables

Materials

1. Dylol
2. Preserved cat
3. Preserved frog
4. Preserved grasshopper
5. Scissors
6. Probes
7. Forceps
8. Pins
9. Dissection tray
10. Protection- glasses and gloves



Independent Variable - Type of dissection

Dependent Variable – Amount of PM 2.5 in the air

Constants – Same Dylol, time tested, all organisms from Carolina Biological, all tests in a school

Control Group – Teachers prep period

Procedure

1. At CHS in Mr. Tuss's room (230) plug a Dylol in on the back counter all day.
2. In periods 0 and 1 dissect cats but leave the Dylol on so his prep period data is collected.
3. At CHS in Mrs. Urban's room (233) plug Dylol in on the back counter all day.
4. In periods 6 and 7 dissect frogs.
5. Leave the Dylol on overnight for more information
6. At CRA in Mrs. Hagenruber's room (101) plug in a Dylol on the back counter all day.
7. In periods 1, 2, 3, 4 and 5 dissect grasshoppers.
8. Use 50 minutes of two dissecting periods and the prep period of the teacher for the information of the experiment.



Conclusions

Our experiment did not support our hypothesis. As seen in the graphs the frog's dissection had the highest average PM 2.5 concentration at around 4.5 ug/m³, the second highest PM 2.5 concentration was the grasshopper at around 4 ug/m³, and the lowest concentration of PM 2.5 was the cat at around 1.5 ug/m³. The control groups for both the frog and the cat had lower levels of PM 2.5 but the grasshopper's control group had around the same level of PM 2.5. We thought the cat would have the highest levels of PM 2.5 due to its size. Overall, the frog had the highest levels of PM 2.5 compared to the dissections tested. Limitations such as having the dissections in different locations and the number of animals being dissected, which were out of our control. In future studies we would focus on the number of dissections we test and having the dissections in the same classroom, as well as the amount of time given to get the necessary information. If we tested the same type of dissection at multiple schools, it would allow people to see who has better ventilation.

Question

How do different dissections affect the PM 2.5 in classrooms?

Hypothesis

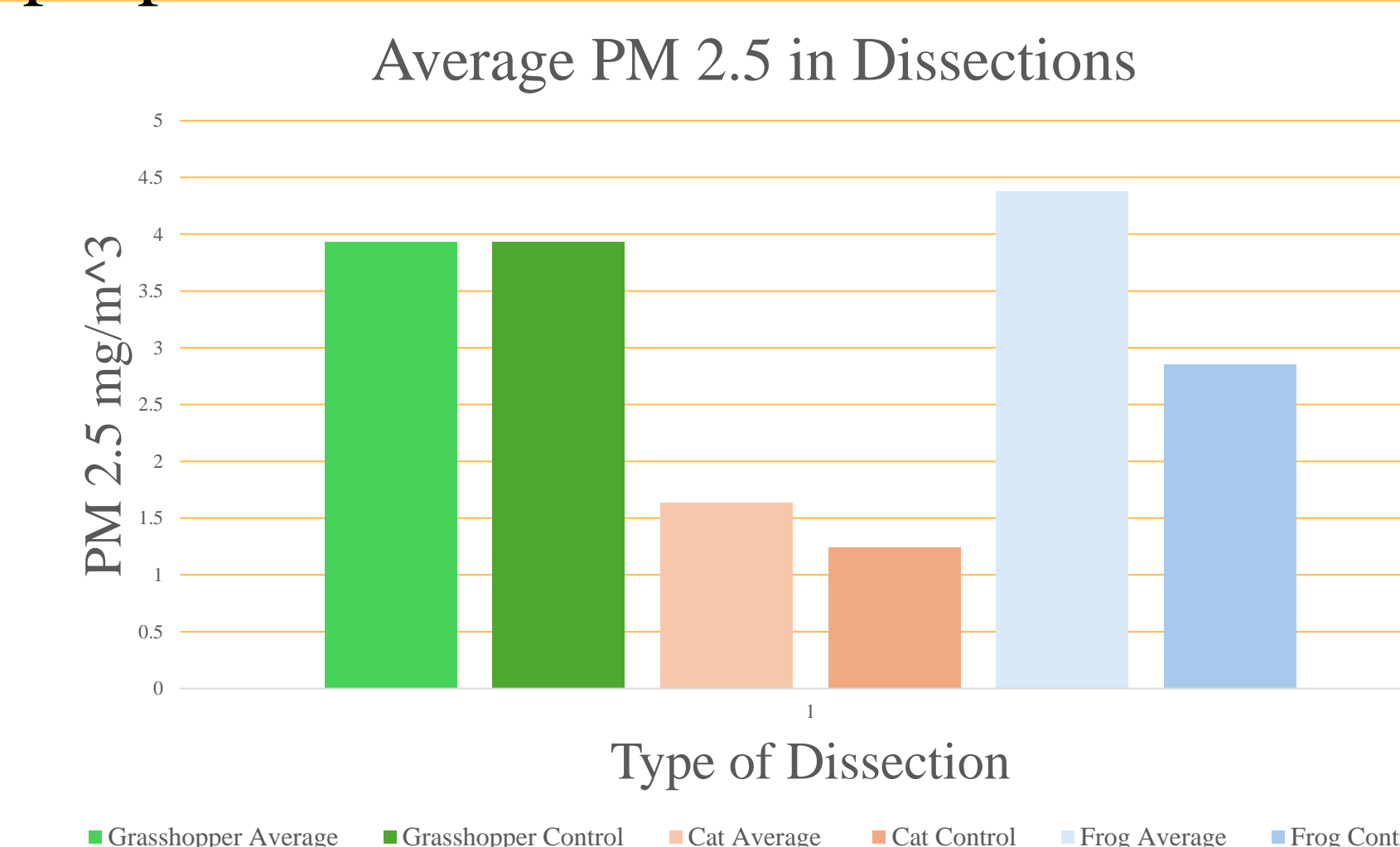
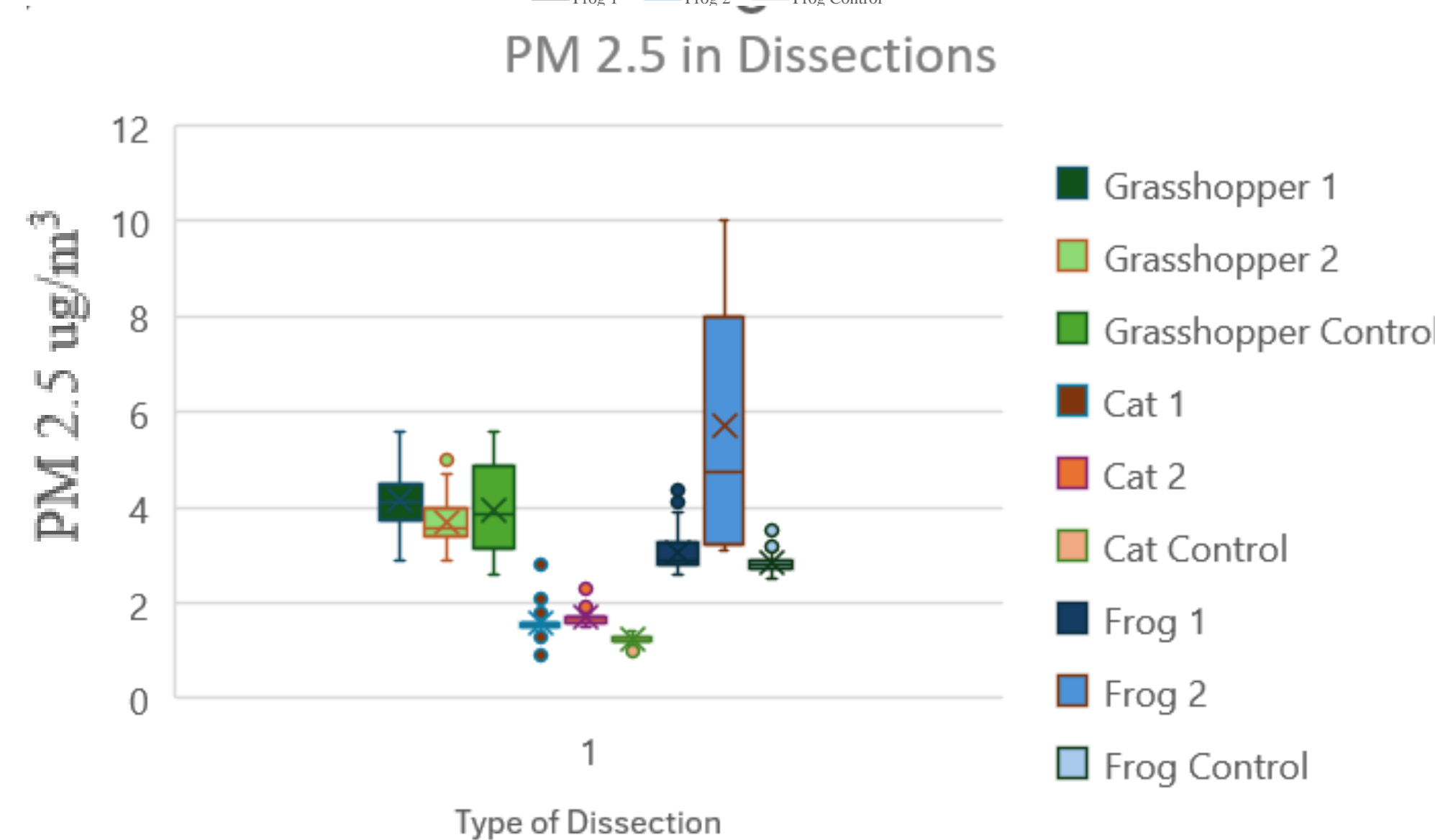
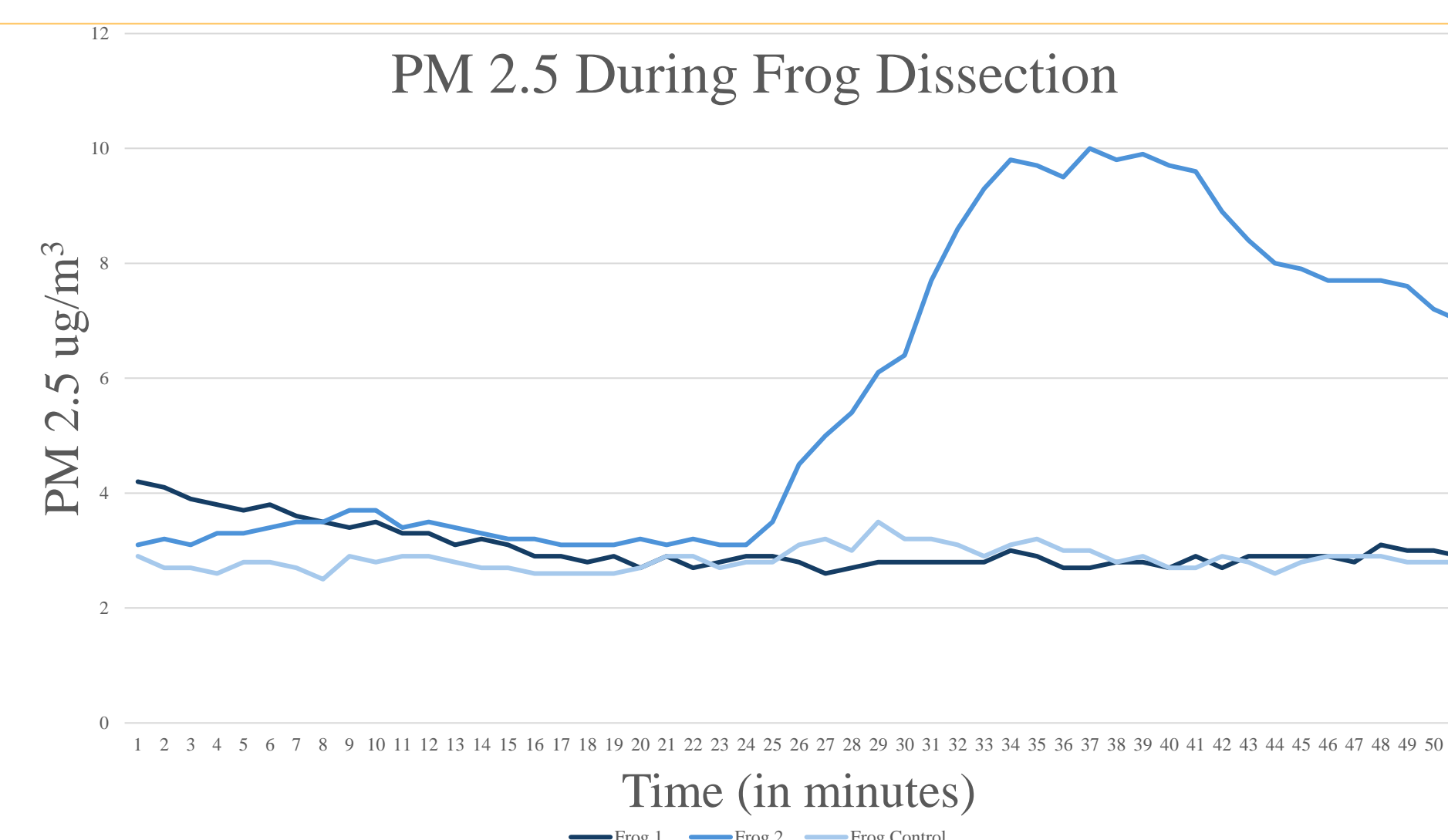
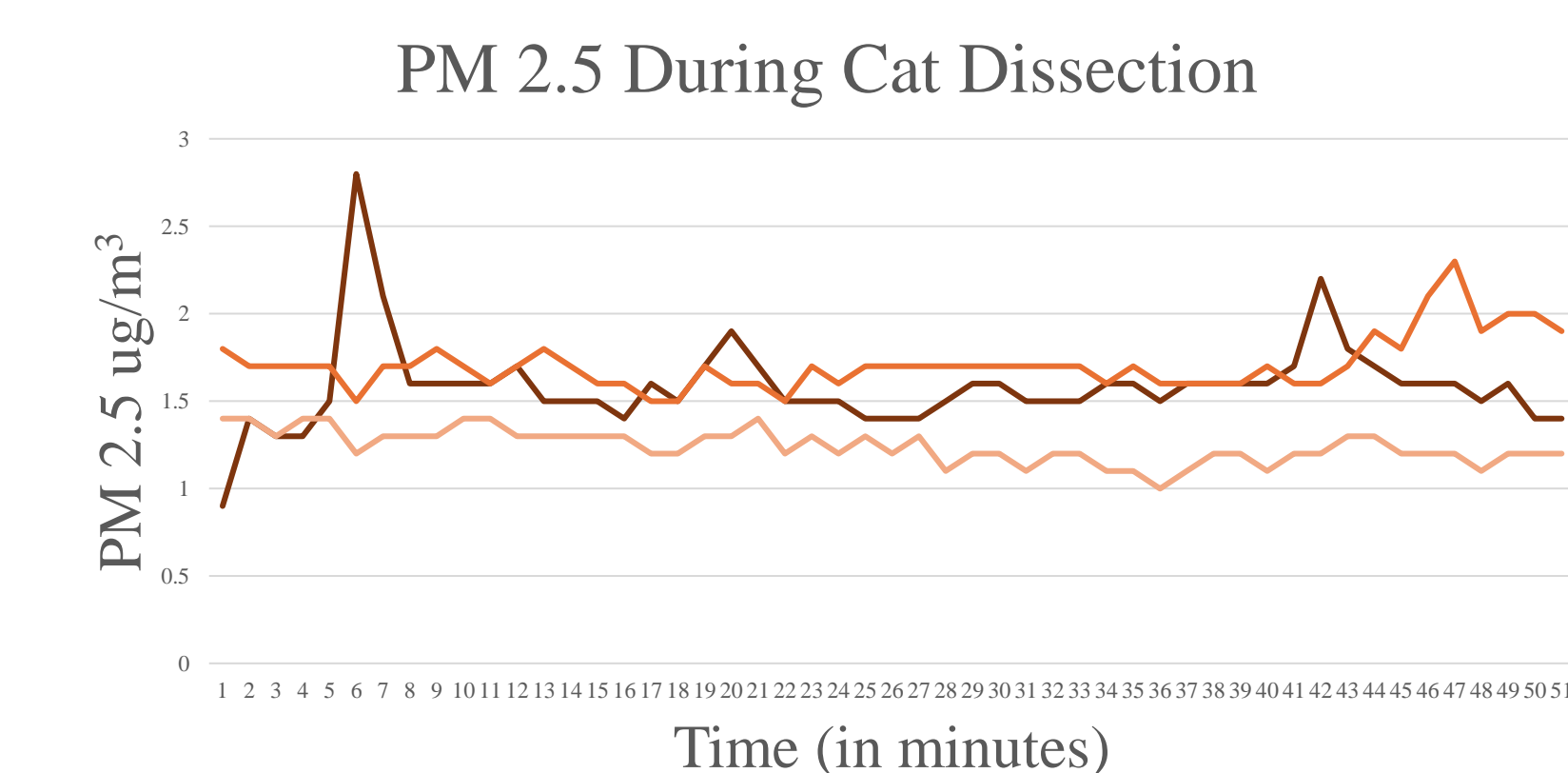
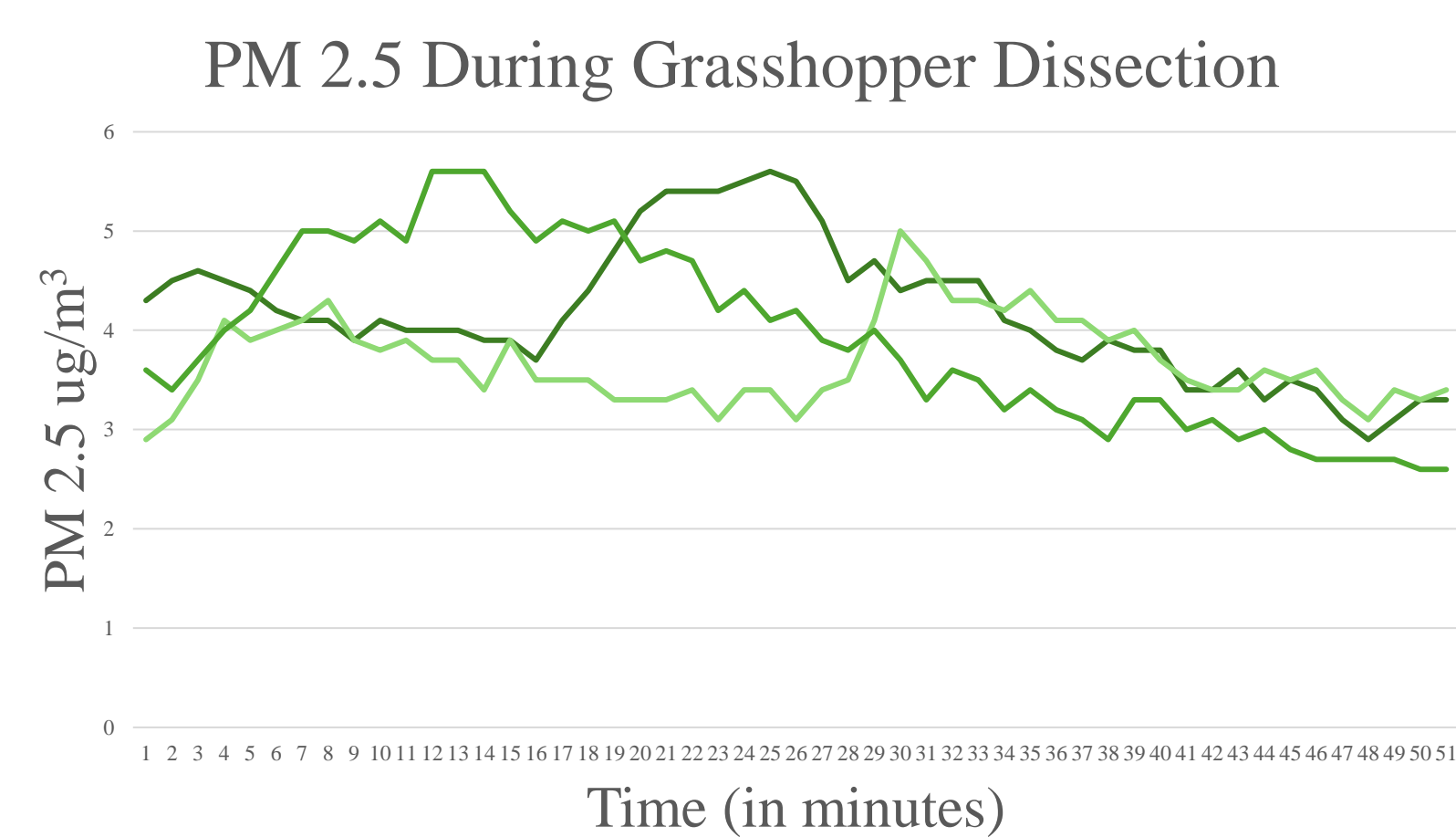
If the animal being dissected is big, then the amount of particulate matter put off will be greater because there is more chemicals in and on the animal due to greater surface area in bigger animals.

Background and Purpose

PM 2.5 is a particulate matter that measures 2.5 microns in diameter or less. Unhealthy amounts of PM 2.5 can increase the risk of health problems like heart disease, asthma, and low birth weight. Shown in the picture below the U.S. Environmental Protection Agency (EPA) shows their PM 2.5 health recommendations within 24 hours. A cat, frog, and grasshopper are the only dissections we tested for PM 2.5 levels. The cats, frogs, and grasshoppers were produced by "Carolina's Perfect Solution®". According to Perfect Solution®, the specimens don't produce dangerous off-gassing, require no special disposal, and the specimens are safe and non-toxic. The chemicals in the solution is proprietary and protected as a trade secret.

US AQI Level	PM2.5 (µg/m³)	Health Recommendation (for 24 hour exposure)
Good 0-50	0-12.0	Air quality is satisfactory and poses little or no risk.
Moderate 51-100	12.1-35.4	Sensitive individuals should avoid outdoor activity as they may experience respiratory symptoms.
Unhealthy for Sensitive Groups 101-150	35.5-55.4	General public and sensitive individuals in particular are at risk to experience irritation and respiratory problems.
Unhealthy 151-200	55.5-150.4	Increased likelihood of adverse effects and aggravation to the heart and lungs among general public.
Very Unhealthy 201-300	150.5-250.4	General public will be noticeably affected. Sensitive groups should restrict outdoor activities.
Hazardous 301+	250.5+	General public at high risk of experiencing strong irritations and adverse health effects. Should avoid outdoor activities.

Results



References

New York State: "Particle Pollution and Health" Revised: March 2024

<https://www.health.ny.gov/environmental/indoors/air/pmqa.htm>

IQAir Staff Writers: "What is the difference between the US AQI and WHO air quality guidelines?" Updated Oct 12, 2016
<https://www.iqair.com/us/newsroom/what-is-the-difference-between-the-us-aqi-and-who-air-quality-guidelines>

EPA: "What is PM, and how does it get into the air?" Updated on July 11, 2023

<https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

Producers of cats and frogs
https://www.carolina.com/preserved-cats/carolinas-perfect-solution-preserved-cats/FAM_228001.pr