

# Kitchen Air Quality Burning Different Cooking Oils

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## Background & Motivation

While cooking, many people do not think about the potential problems of using different cooking oils. There are so many indoor pollutants, it is important to be careful to try to minimize these. There are certain temperatures for the smoke points for different cooking oils. In this experiment butter and olive oil were compared.



Figure 1: POD Air Quality Monitor next to burning butter

## Methodology

CO<sub>2</sub> and VOCs were measured over a period of 20 minutes in the kitchen. Butter has slightly lower smoke point than olive oil. (374 F for extra virgin olive oil, and 300 F for butter) The experiments were taken a day apart so that no CO<sub>2</sub> or VOCs were leftover.

## Results

- Butter has a lower smoke point than olive oil
- Butter emitted more CO<sub>2</sub> and VOCs than extra virgin olive oil.
- CO<sub>2</sub> and VOCs were clearly correlated
- Highest measured values were seen with hood off and burning beginning
- Spike in the beginning was most likely related to turning on stove.

## Data Limitations

- Only one POD used
- CO<sub>2</sub> sensor did not work
- Temperature was not exact; the experiment was regulated by time and stove setting. Butter and olive oil were set to medium heat.

## Discussion

Butter had worse emissions than olive oil. Originally, I believed olive oil had the lowest smoke point, but butter is lower. It is important to become educated on the smoke points for different oils for cooking, because the CO<sub>2</sub> and VOCs released are high when the oil and butter began to burn.

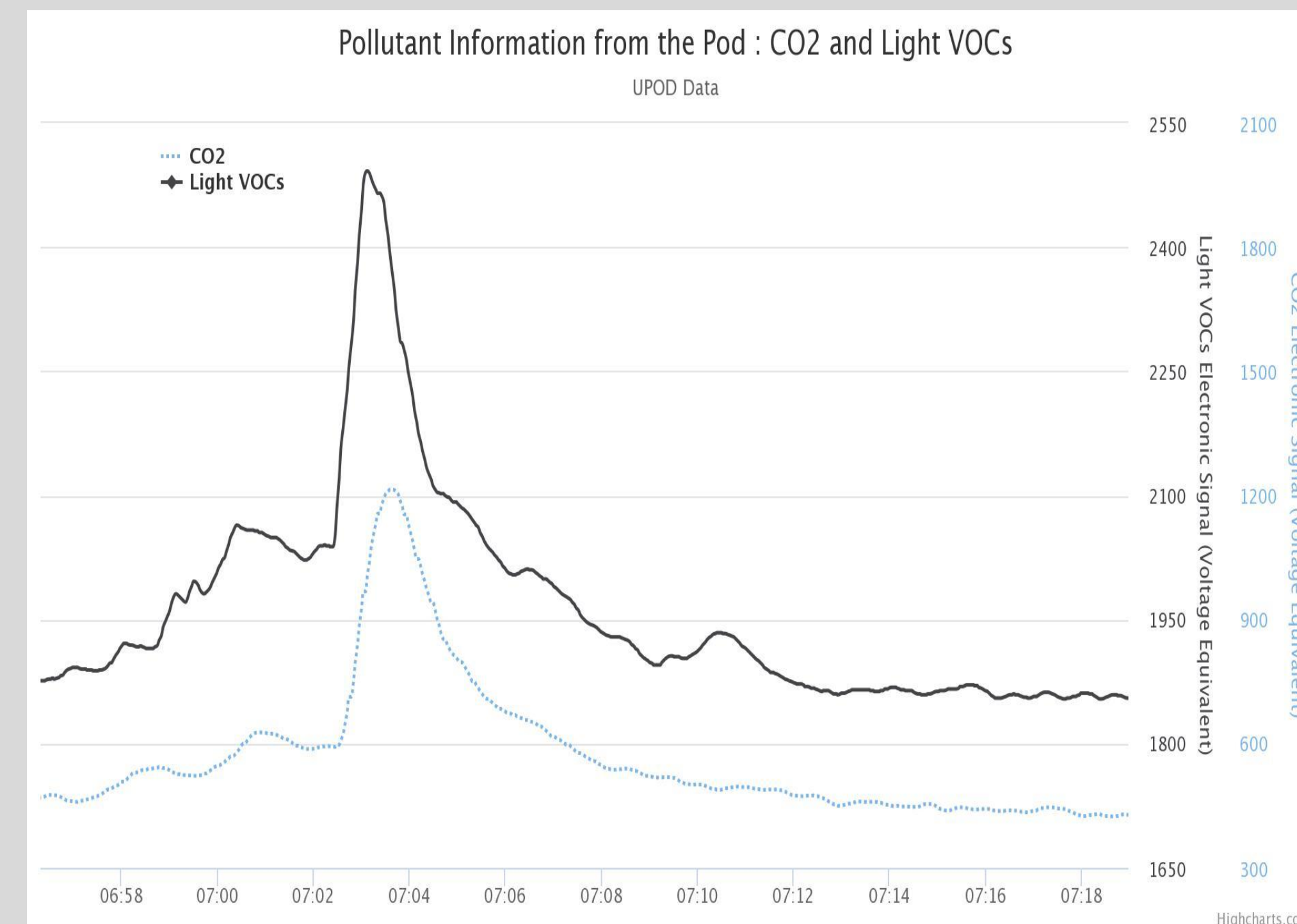


Figure 2: Carbon Dioxide and VOCs for Butter

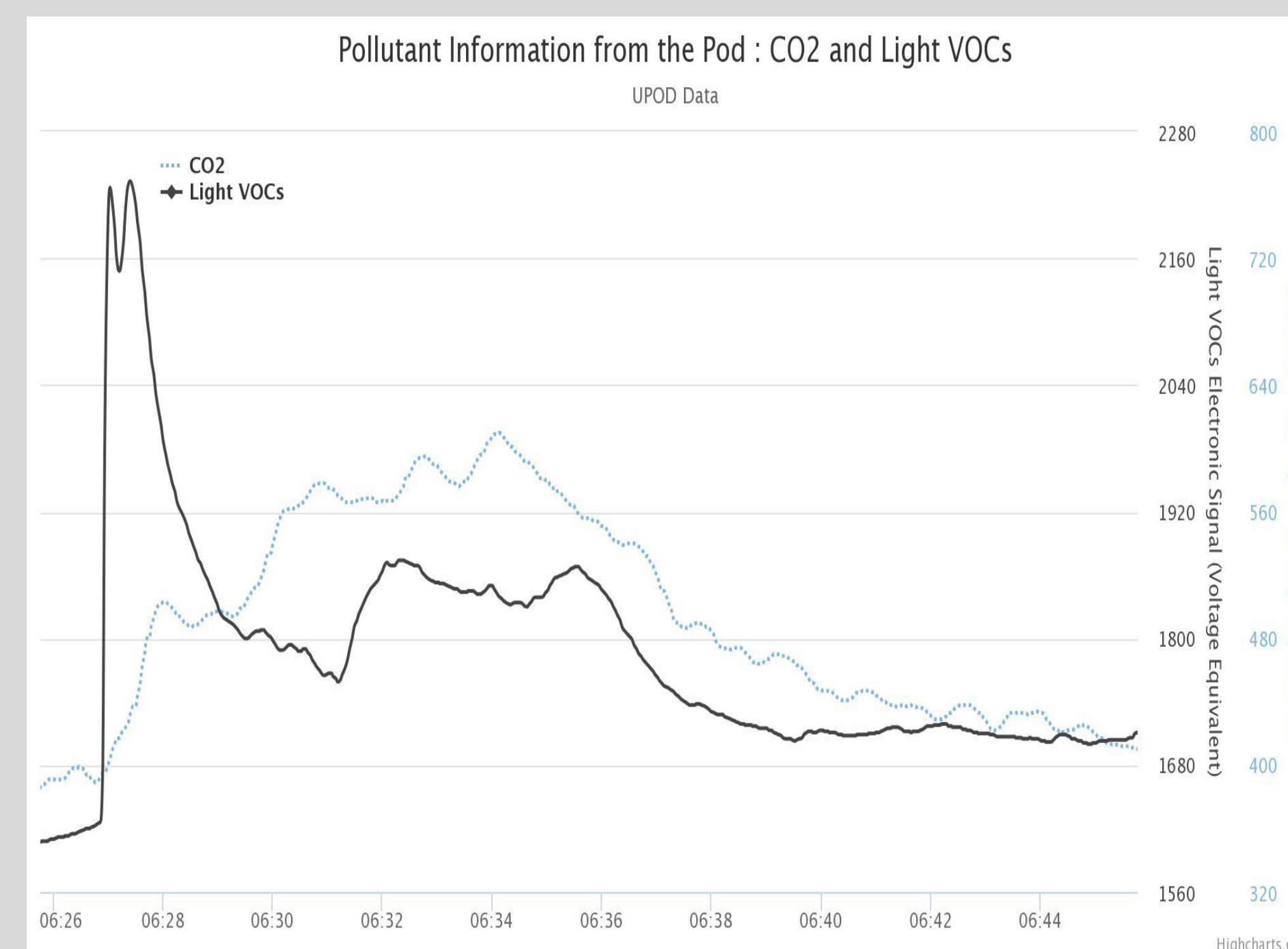


Figure 3: Carbon Dioxide and VOCs for Olive Oil

## Conclusions

- Pay attention to the smoke point for different oils.
- If unsure, use cooking oils with higher smoke points.
- Olive oil hit the smoke point slower than butter.
- Use the hood for ventilation.

## Acknowledgements

Thanks to Dr. Daniel Knight, Dr. Michael Hannigan, and Kristen Okorn for their instruction and support through this course and thanks to the Hannigan Lab for lending me their air quality sensors. None of this would have been possible without you!

## References

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- [2] <https://www.theglobeandmail.com/life/health-and-fitness/health/smoke-point-matters-in-cooking-with-oil/article26569060/>