



SOLAR EVAPORATION FOR URINE SEPARATION

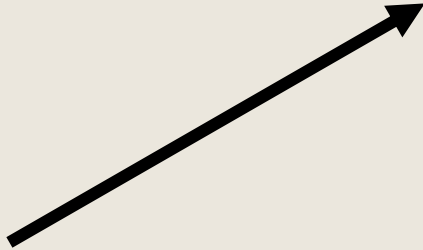
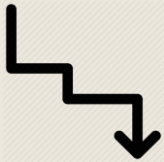
Nikita Kowal

Mentor: Dr. Treavor Boyer

Overview

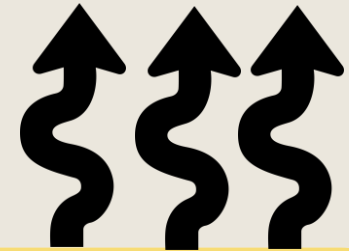
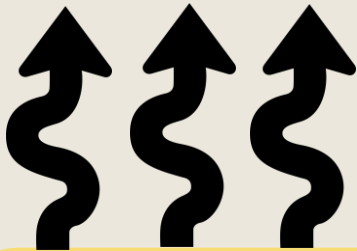
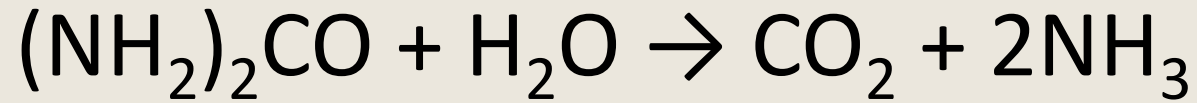
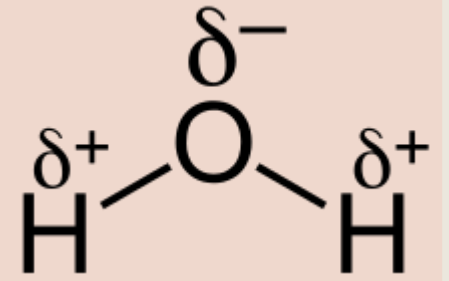
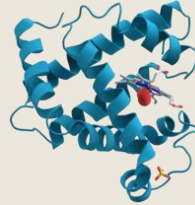
- Background
- Project Description
- Procedure
- Results
- Conclusion
- Acknowledgements

Background



N P K

Project Description



Research Question

- How does the evaporation of synthetic fresh urine compare to hydrolyzed urine?
- How does acid addition impact the nutrient recovery of fresh and hydrolyzed urine?

Procedure

Set-Up for Experiments:

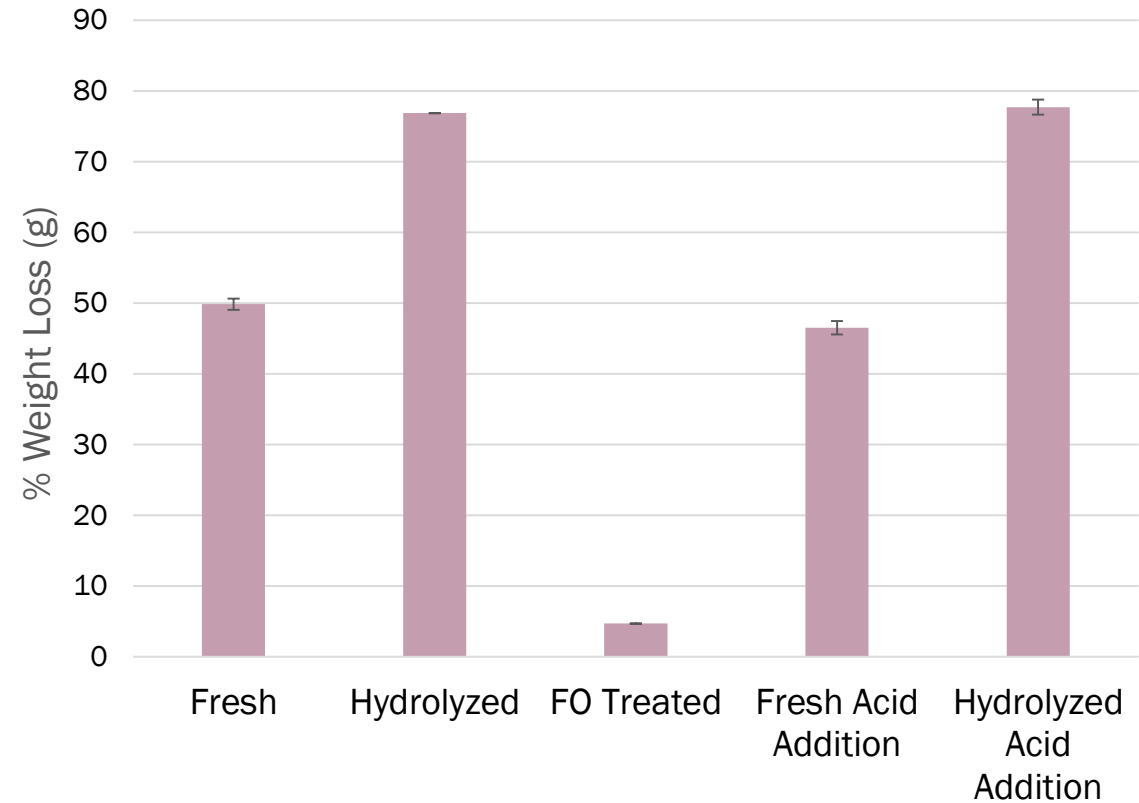
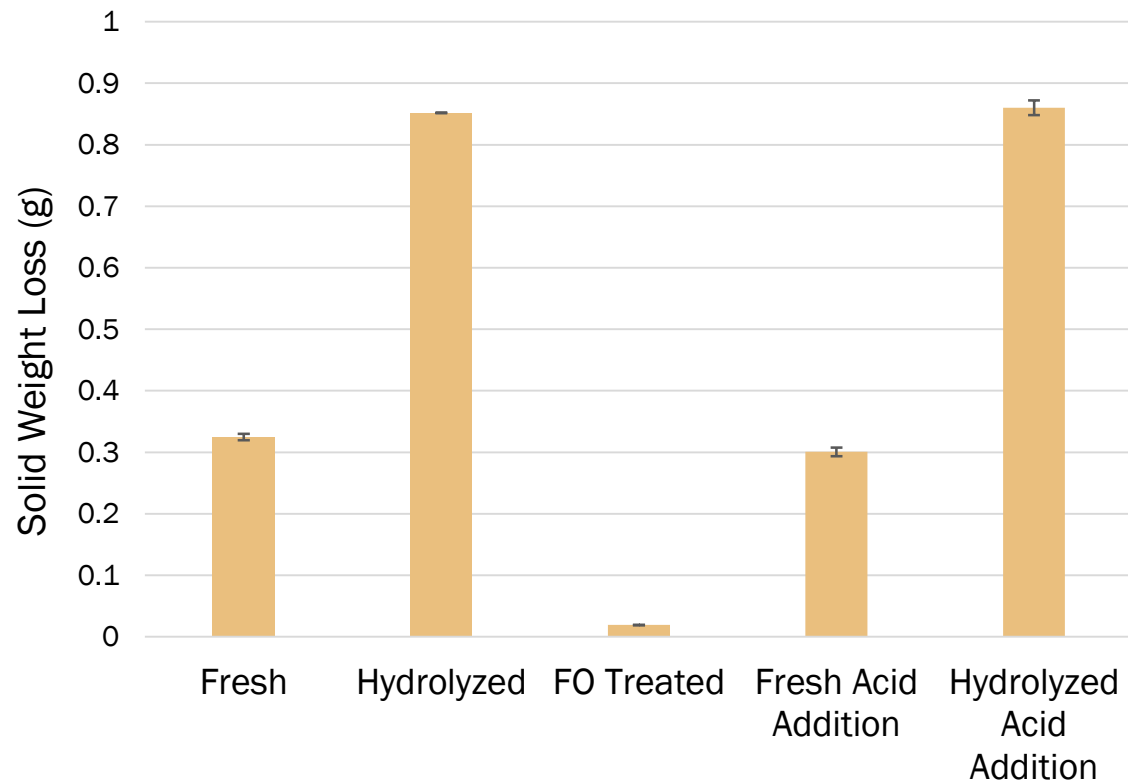
- Mass Balance on Fresh and Hydrolyzed after Evaporation
- Analyze composition of remaining solids to examine the change after heating and evaporating the water from the urine.

Analytical tool:

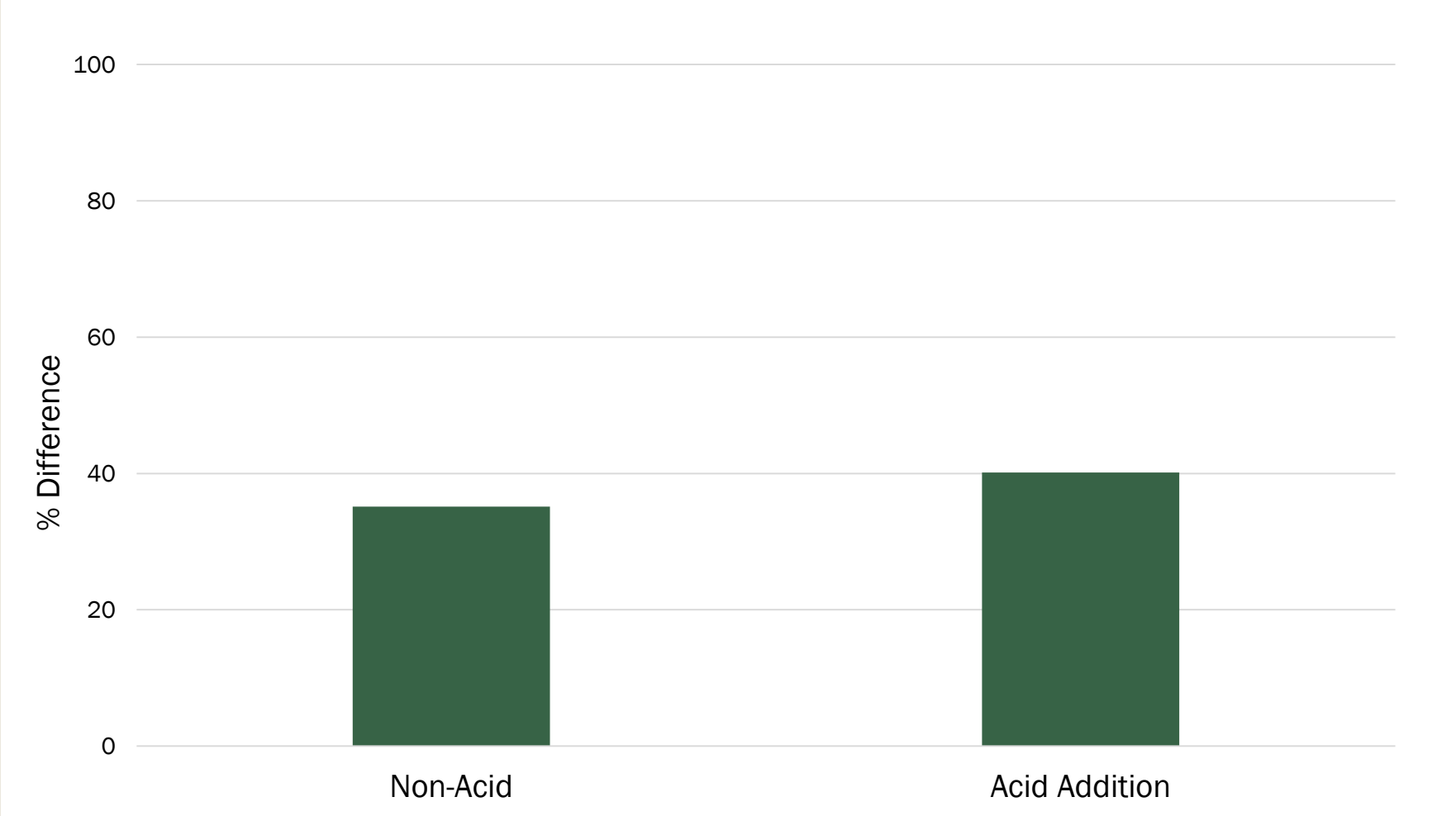
- Total Organic Carbon Analysis (Total Nitrogen)



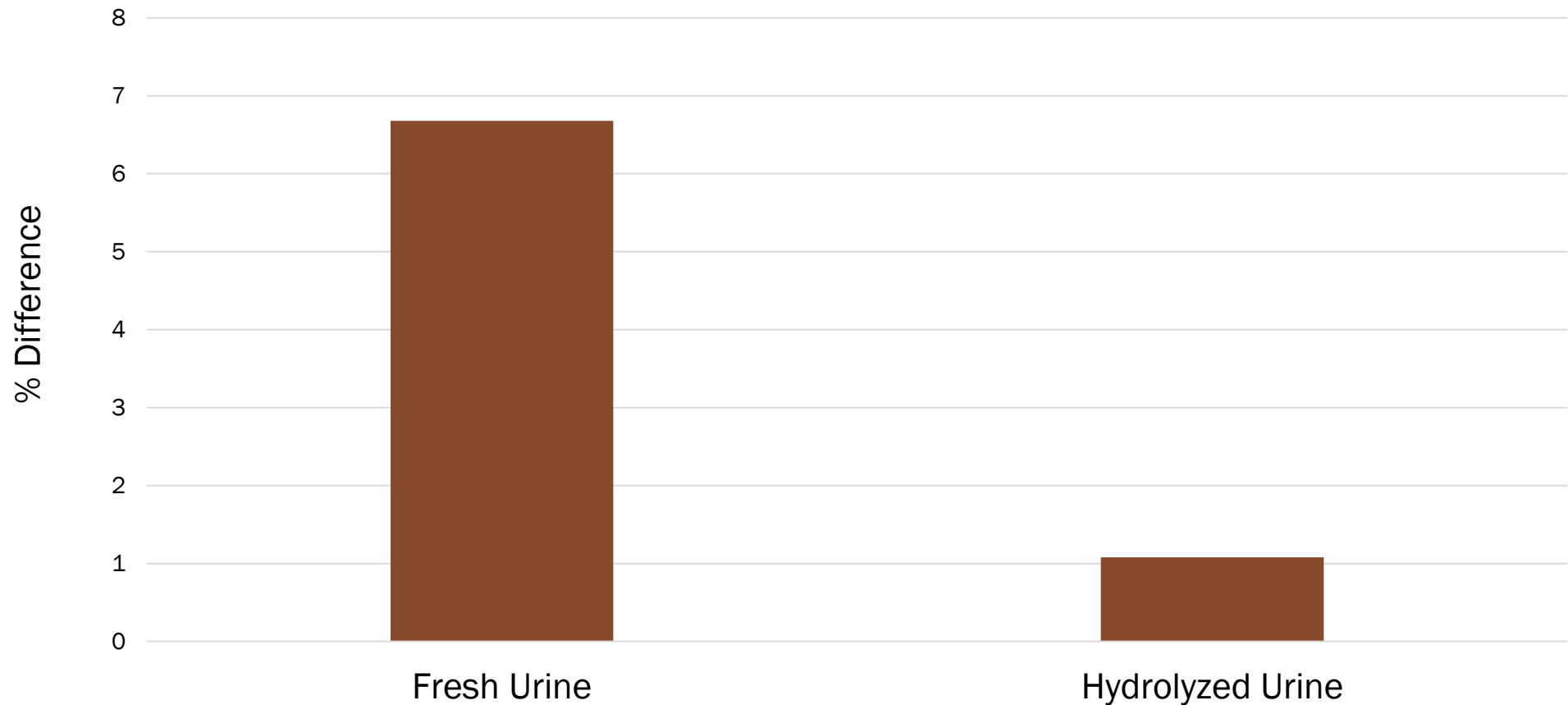
Results: Fresh Urine vs. Hydrolyzed Urine



Results: Fresh Urine vs. Hydrolyzed Urine



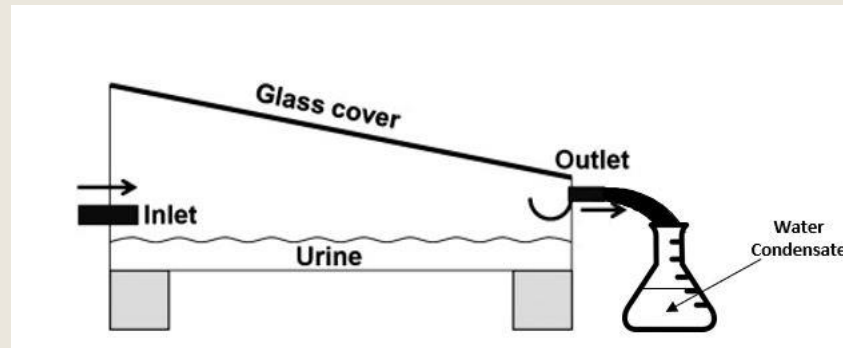
Results: Affect of Acid Addition



Conclusion

- There was significant differences between hydrolyzed urine and fresh urine nutrient recovery.
- Acid addition increases the rate of evaporation of nutrients in fresh urine.

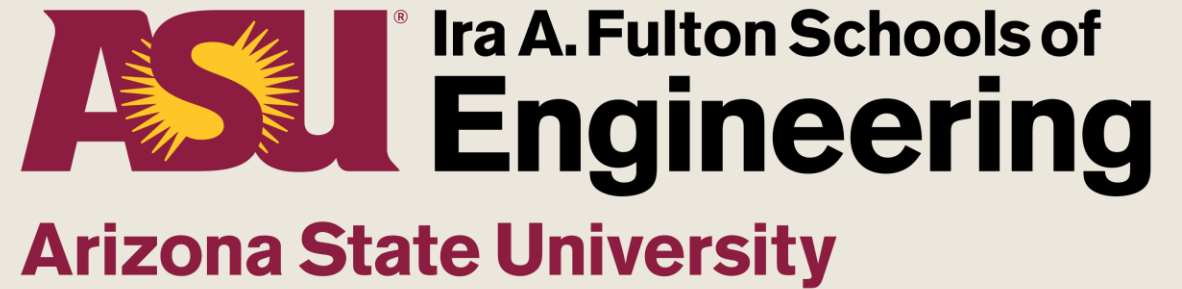
Future Directions...



Acknowledgements

Special Thank You to:

- Dr. Treavor Boyer
- Neha Jagtap
- Hannah Ray
- Daniella Saetta
- Desiree Crawl
- Thomas Sharp



Questions?