

THE BUNNY POOP PROJECT

The Use of Rabbit Fecal Matter for Lignin Degradation in Wastewater Treatment Systems

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RESEARCH QUESTION

Lignin is very difficult to break down (1) and is generally discarded as waste (2).

Meaning, the conversion of Volatile Fatty Acids (VFAs) to Methane, used for energy production (3).

These reactors break down biosolids by exposing the waste to complex microbial communities (5).

Does the predigestion of lignin by a microbial enrichment improve valuable product recovery and reduce the amount of solids from anaerobic digesters at wastewater facilities?

The microbes present in rabbit fecal matter were used, as rabbits eat foods with high concentrations of lignin.

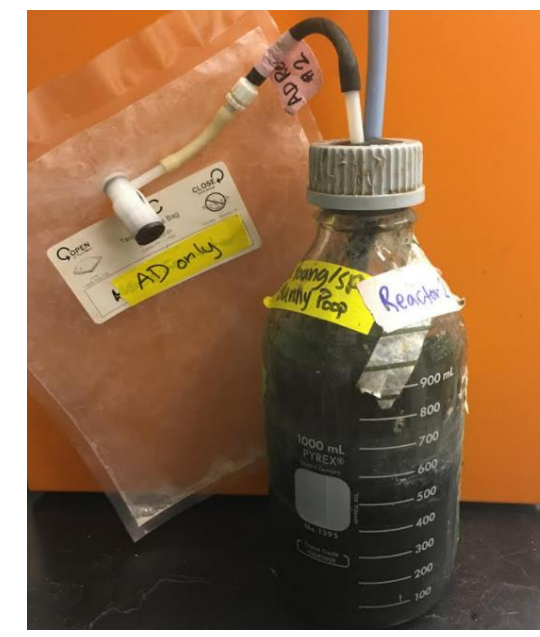
Lignin is present in solids, like toilet paper (4). These solids are measured by a metric called Total Solids (TS).

METHODS

There are 4 reactors:



1. Fermentative (Ferm) Functions as pretreatment for the plant matter.



2. Anaerobic Digester (AD) Functions as a control.



3. Anaerobic Digester + Ferment (AD+F) Tests the effectiveness of the pretreated plant matter.

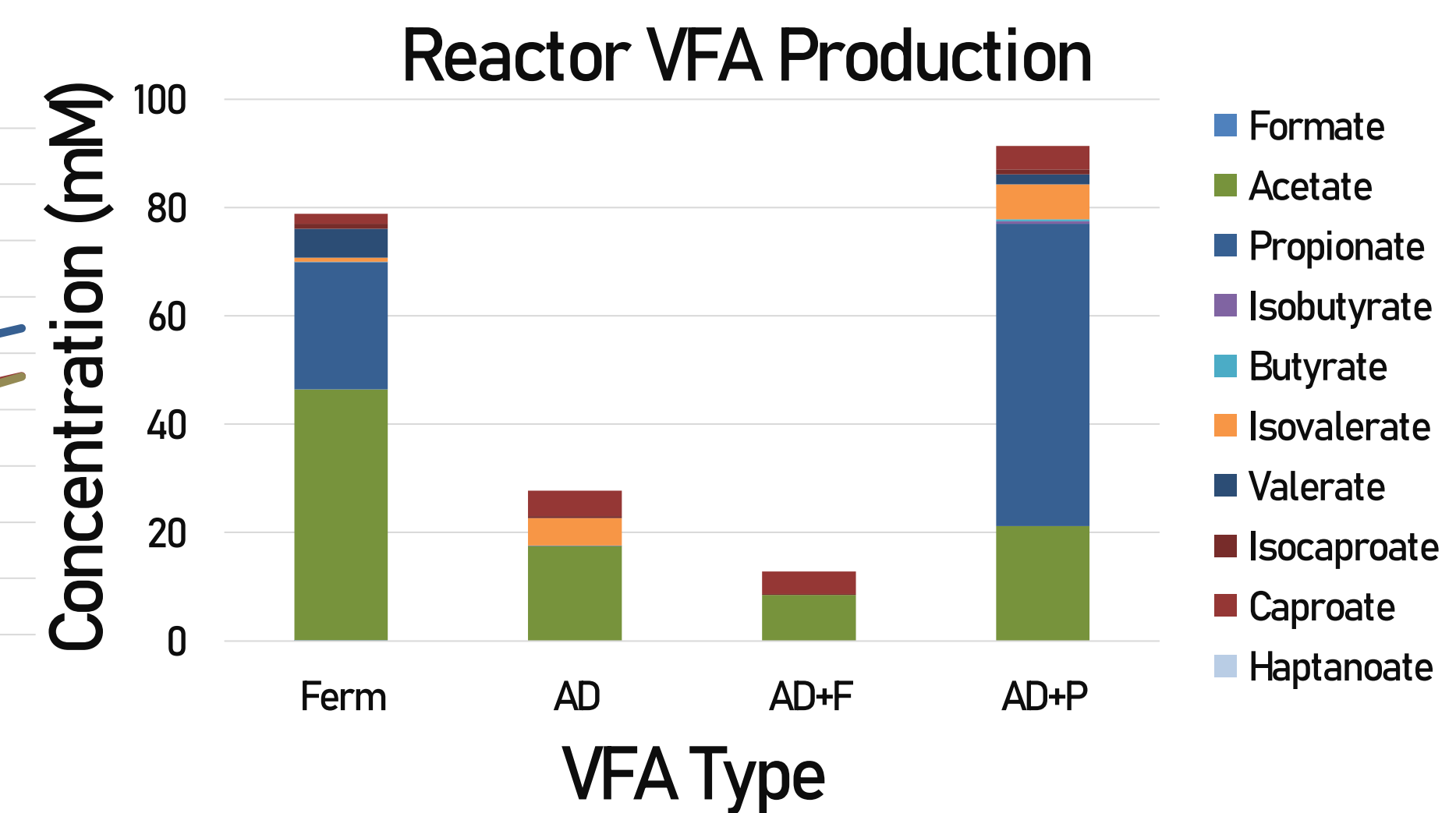
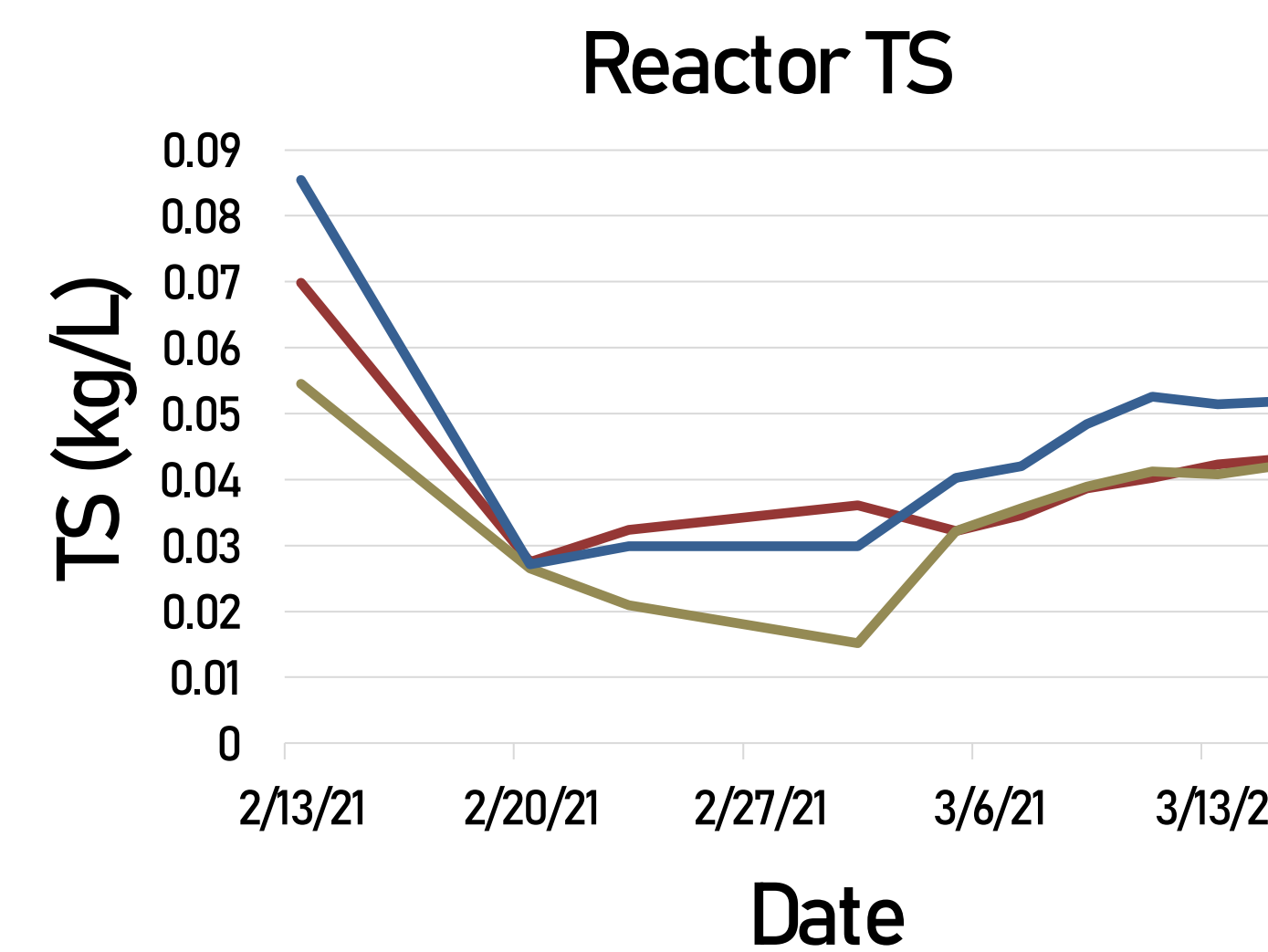
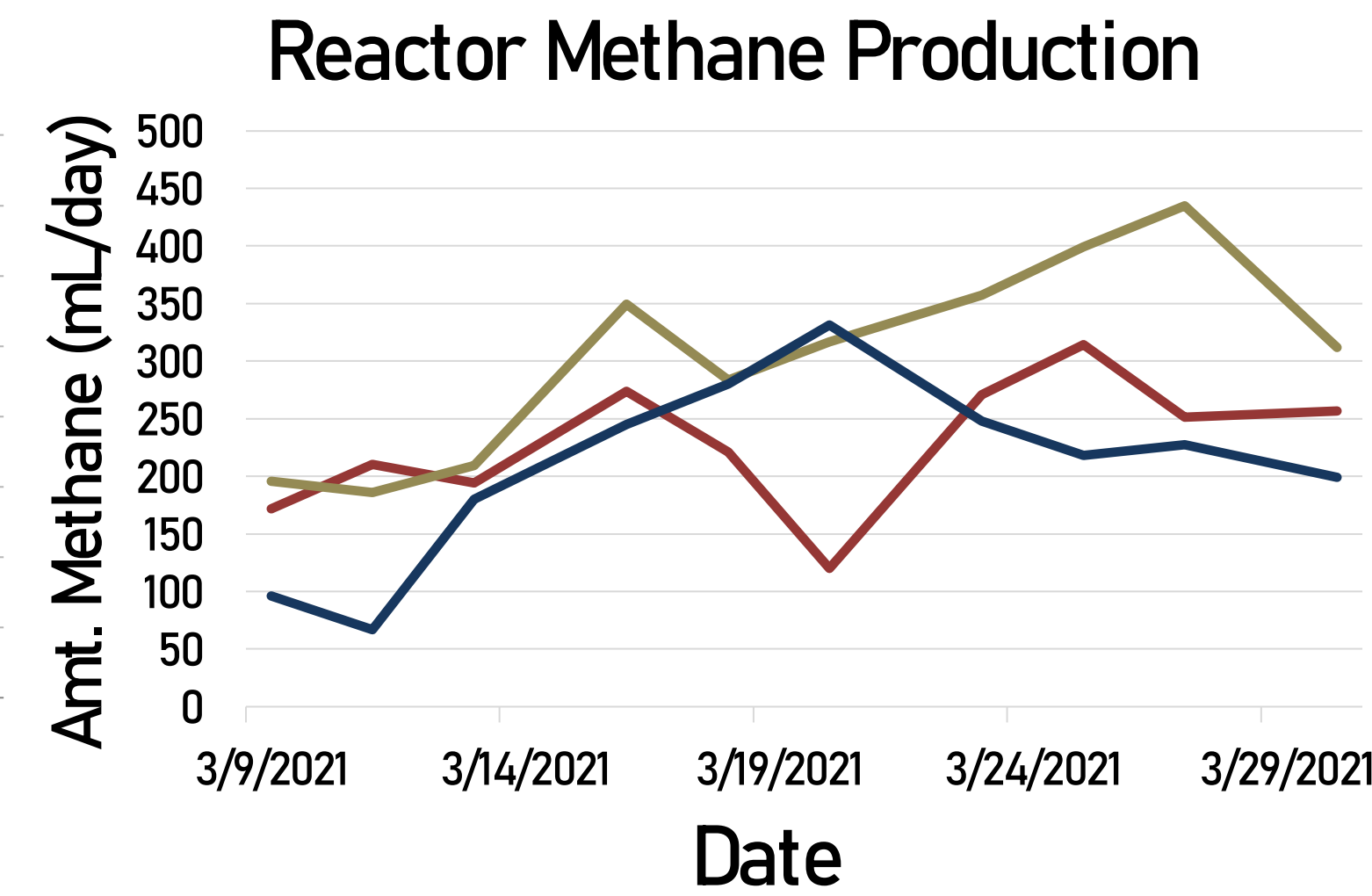
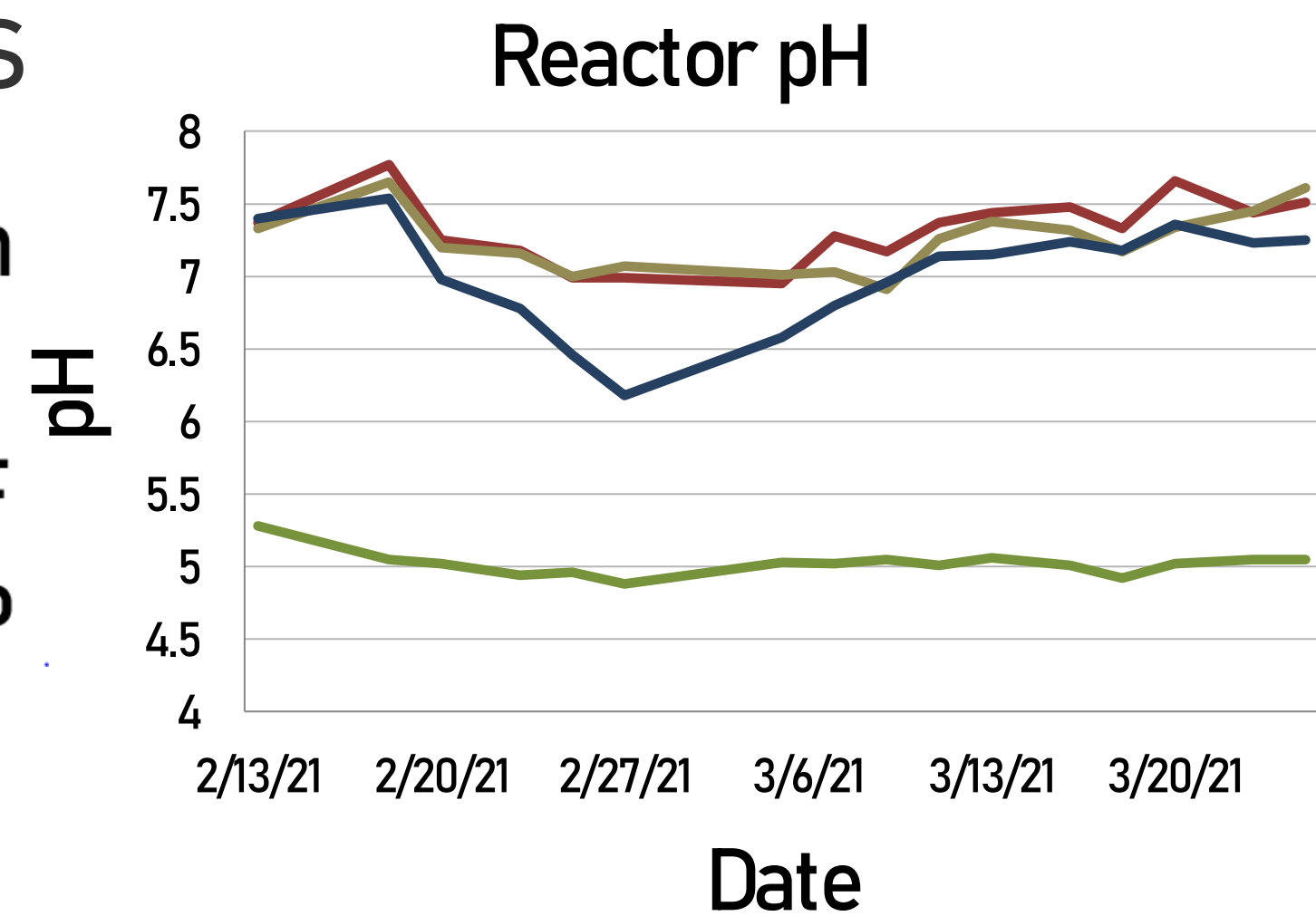


4. Anaerobic Digester + Plant (AD+P) Determines if the pretreatment causes a significant difference.

RESULTS

Legend for Reactor pH and Methane Production:

- Ferm (Green)
- AD (Red)
- AD+F (Olive)
- AD+P (Blue)



CONCLUSION

The addition of pretreated plant matter to an AD reactor maintained pH more efficiently, increased the methane production, decreased the TS output, and increased the conversion of VFAs to methane.

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