

QUARTERLY PROGRESS REPORT

September 2025 – November 2025

PROJECT TITLE: Evaluating Barriers to Adoption of Sustainable Food Waste Management

PRINCIPAL INVESTIGATOR(S):

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PROJECT WEBSITE: [Hinkley Project - UF/IFAS Agricultural and Biological Engineering](#)

WORK ACCOMPLISHED DURING THIS REPORTING PERIOD:

Work during this reporting period included recruiting and training students, establishing a project website, conducting our first TAG meeting, and beginning work on Objectives 1 and 2 as described below.

Objective 1 is to evaluate the compositional variability and methane potential of restaurant food waste. This objective includes collecting samples of real restaurant food waste, characterizing that waste, and carrying out biomethane potential (BMP) testing. During the current reporting period, Dr. Martin-Ryals' team collected two samples of food waste and carried out two biomethane potential tests, with one still in progress. The first BMP test was conducted using a combination of restaurant grease trap waste (FOG) and wastewater biosolids. These are two potential co-digestion feedstocks, that could be treated in combination with food waste in an anaerobic digester. Results from that BMP test are shown in Figure 1 below. It was determined that increasing the ratio of FOG combined with biosolids up to 30:70 as volatile solids (VS) added, can provide a benefit to methane production. But higher levels of FOG (50:50 as VS added) led to a slight reduction in methane production, and exhibited an extended lag period. Future BMP testing should evaluate co-digestion of FOG and/or biosolids with restaurant food waste.

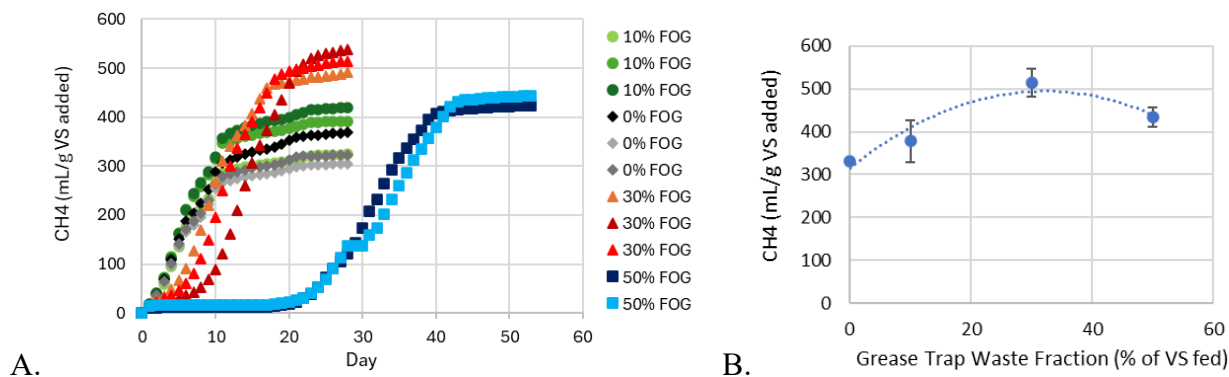


Figure 1. (A) Methane production over time in each condition of the FOG BMP Test 3: 50, 30, 10, and 0% of VS fed as restaurant grease trap waste with wastewater biosolids. (B) Correlation between maximum specific methane production and fraction of restaurant grease trap waste (as VS) co-digested with wastewater biosolids.

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The second BMP test was conducted on food waste only. Two samples of real food waste were collected from the dining halls on the University of Florida campus (Figure 2). Each food waste sample was blended separately to create two homogeneous mixtures. Then each mixture was combined with inoculum and loaded into the BMP testing apparatus in triplicate. Inoculum only and microcrystalline cellulose controls were also set-up, in triplicate. This BMP test is on-going. Samples of the grease trap waste, biosolids, and each of the two food waste mixtures will be sent to Midwest Laboratories for proximate analysis. This process of collecting food waste samples, conducting BMP testing, and sample characterization will continue every 28-35 days over the course of the project to build a dataset of real food waste composition and corresponding biomethane potential.

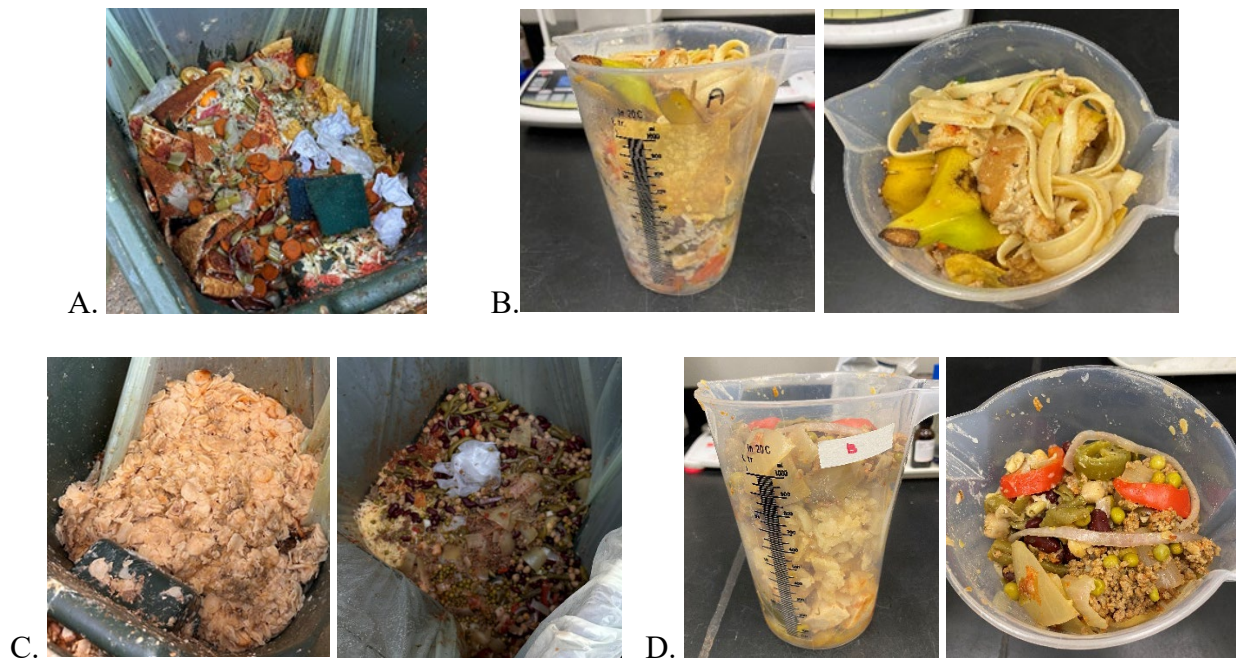


Figure 2. (A) Image of food waste sampled from first location. (B) Food waste sample from first location that was brought back to the lab for BMP testing. (C) Images of food waste sampled from second location. (D) Food waste sample from second location that was brought back to the lab for BMP testing.

During our initial expedition to collect and characterize food waste from the UF dining halls, we observed that real food waste can be quite variable and heterogeneous. Each waste container that we opened (10 total, from two locations on two different days) had a different food waste mixture within. The main driver of food waste variability appeared to be the menu that had been offered the previous day. Given how heterogeneous the food waste was, with much of it consisting of prepared foods (e.g., pizza, scalloped potatoes), we determined that it would not be feasible to characterize the food waste mixtures based on food groups (e.g., bread, vegetables, meat etc.). In addition, given the large volume and heterogeneity of the waste, we also determined that it would not be feasible to collect a sample for BMP testing that was truly representative of the complete food waste profile contained in all the containers at that point in time. Given this, our team has determined that it will not be feasible to quantify temporal variability of real restaurant food waste

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within the scope of this project. Rather, we will focus our efforts on understanding the impact of variable food waste composition on methane production and corresponding economic outcomes. In the next reporting period, we also aim to sample off-campus restaurant food waste.

Objective 2 is to evaluate public perceptions of alternative food waste management strategies.

For this objective we intend to interview various stakeholder groups regarding their perceptions of alternative food waste management strategies, namely anaerobic digestion and composting. From these interviews, we aim to identify different barriers of adoptions relevant to the various stakeholder groups. During the current reporting period we finalized a set of interview questions for our first stakeholder group, which will consist of policy makers and waste management officials. We also established a list of interviewees from around the state of Florida that we will contact for interviews. Our first interviews are set to begin the first week of December, and will continue into January. In the next reporting period, we will carry-out the same procedure focusing on restaurant owners.

TAG MEETINGS:

Date: October 8, 2025

Participants (name/title/email):

- Ana Martin-Ryals, Assistant Professor, admartin@ufl.edu
- Catherine Campbell, Assistant Professor, cgcampbell@ufl.edu
- Tim Townsend, Executive Director, Hinkley Center, ttown@ufl.edu
- Steve Laux, P.E., Hinkley Center, steven.laux@essie.ufl.edu
- Hannah Sackles, Hinkley Center, hsackles@ufl.edu
- Rick Hutton, GRU Principle Engineer, huttonrh@gru.com
- Patrick Irby, Waste Collection & Alternatives Manager, Alachua County
pirby@AlachuaCounty.US
- Matthew Mueller, Director of Food and Beverage Services, UF, mmueller1@ufl.edu
- Dustin Craig, Environmental Engineer, CDM Smith, craigdl@cdmsmith.com
- Sherry Carpenter, Executive Director, Keep Florida Beautiful,
scarpenter@keepfloridabeautiful.org
- Del Bottcher, President of Soil and Water Engineering Technology Inc.,
dbottcher@swet.com
- Amir Varshovi, Founder/CEO of Green Technologies LLC, avarshovi@green-edge.com

List of TAG members who were **unable** to attend this meeting:

- Eric Neihaus, GRU Planning Engineer, NeihausEW@gru.com
- Justin Stankiewicz, Director of RNG Development, Chesapeake Utilities Corporation,
jstankiewicz@chpk.com

[Link to the video recording of the TAG meeting](#)

METRICS REPORTING:

1. Summary of input provided by the TAG during this period.

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Minutes from the first TAG meeting held on October 8, 2025, are available on the project website. This meeting served to orient the TAG to the objectives of the project and solicit their feedback. TAG input from that meeting has helped guide our approach to developing the interview and survey instruments. Since that meeting, additional input was provided by TAG member Matt Mueller, Director of Food and Beverage Services at UF. Matt assisted the team with collecting real food waste was UF dining halls for BMP testing. He also provided insight into restaurant operations, and considerations for approaching restaurant owners for our next round of food waste sampling and interviews. We plan to prepare those interview questions and reach out to restaurant owners in the next reporting period. TAG members were also solicited and provided suggestions regarding potential interviewees in the policy and waste management sectors. Two TAG members agreed to participate in cognitive interviews to finalize the policy stakeholder interview instrument.

2. Publications resulting from **THIS** Hinkley Center project.

None

3. Research presentations resulting from (or about) **THIS** Hinkley Center project.

None

4. List who has referenced or cited your publications from this project.

None

5. How have the research results from **THIS** Hinkley Center project been leveraged to secure additional research funding? What additional sources of funding are you seeking or have you sought?

No additional funding has been secured at this time. However, the PIs did submit a USDA NIFA proposal titled: *Hyperspectral Imaging And Bioelectrochemical Sensing For Increased Efficiency Of Anaerobic Digestion Of Food Waste*, which would expand on the work being done for this Hinkley Center project.

6. What new collaborations were initiated based on **THIS** Hinkley Center project?

None

7. How have the results from **THIS** Hinkley Center funded project been used (not will be used) by the FDEP or other stakeholders?

None

PICTURES: None at this time