

Supplemental Materials

# Anaerobic Co-digestion to Enhance Waste Management Sustainability at Yosemite National Park

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**Table S1. Experimental design of biochemical methane potential incubations**

| Treatment        | Inoculum   |                    | Food Waste      |                    | Wastewater Solids |                    |
|------------------|------------|--------------------|-----------------|--------------------|-------------------|--------------------|
|                  | Volume, mL | Volatile Solids, g | Total Weight, g | Volatile Solids, g | Total Weight, g   | Volatile Solids, g |
| Inoculum control | 150        | 2.12               | 0.00            | 0.00               | 0.00              | 0.00               |
| 0% FW            | 102        | 1.44               | 0.00            | 0.00               | 48.47             | 1.41               |
| 10% FW           | 105        | 1.48               | 0.46            | 0.14               | 44.90             | 1.30               |
| 25% FW           | 110        | 1.56               | 1.20            | 0.37               | 39.18             | 1.14               |
| 50% FW           | 119        | 1.68               | 2.59            | 0.80               | 28.24             | 0.82               |
| 75% FW           | 130        | 1.84               | 4.24            | 1.31               | 15.41             | 0.45               |
| 90% FW           | 138        | 1.95               | 5.40            | 1.67               | 6.54              | 0.19               |
| 100% FW          | 143        | 2.00               | 6.22            | 1.93               | 0.00              | 0.00               |

Each incubation had a total volume of 150 ml and a ~1:1 ratio of VS in inoculum to VS in combined food waste (FW) and wastewater solids (WWS).

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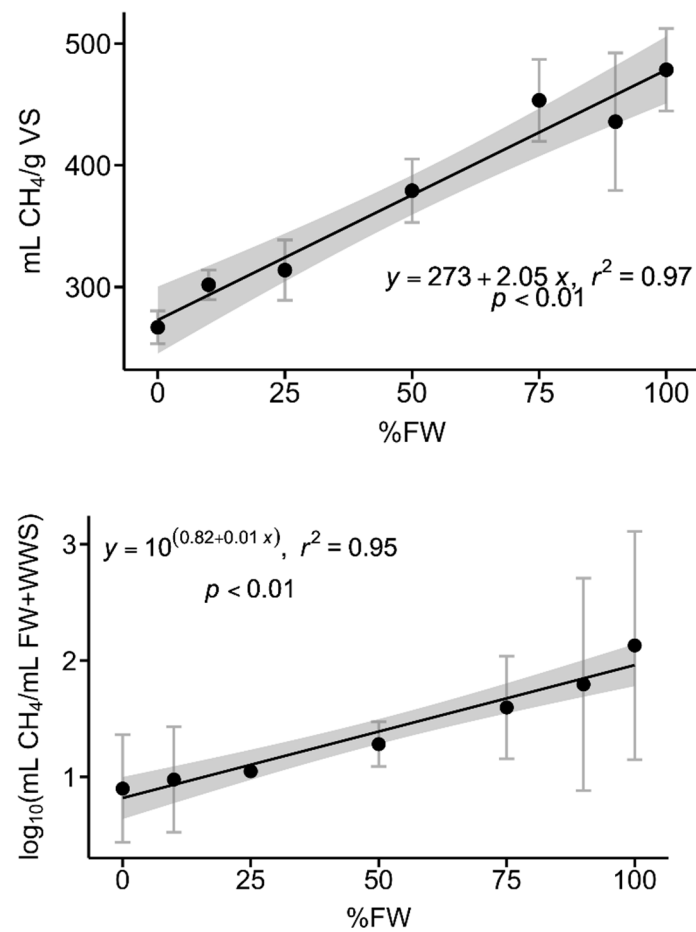
**Table S2. Summary of Park waste characterization and production.**

|  | Inoculum | Wastewater Solids | Food Waste |
|--|----------|-------------------|------------|
| Waste Quality                              |          |                   |            |
| Density, g/mL                              | 1.01     | 1.01              | 1.10       |
| Total solids, g/g                          | 0.022    | 0.038             | 0.32       |
| Volatile solids, g/g                       | 0.014    | 0.029             | 0.31       |
| Waste Production at Yosemite National Park |          |                   |            |
| Total, kg/yr                               | NA       | 5,100,000         | 1,000,000  |
| Total solids, kg/yr                        | NA       | 194,000           | 320,000    |
| Volatile solids, kg/yr                     | NA       | 148,000           | 310,000    |

**Table S3. Summary of biochemical methane potential experimental results.**

| Treat-<br>ment | Initial<br>pH | Final<br>pH | Specific<br>Methane<br>Yield,<br>mL CH <sub>4</sub> /g VS | Volumetric<br>Methane<br>Yield,<br>mL CH <sub>4</sub> /mL | Biogas<br>Methane<br>Content,<br>% |
|----------------|---------------|-------------|---|---|------------------------------------|
| 0% FW          | 7.09          | 7.09        | 267 ± 16  | 7.9 ± 0.4   | 59.5 ± 1.1                         |
| 10% FW         | 7.04          | 7.12        | 302 ± 15  | 9.5 ± 0.5   | 62.8 ± 0.6                         |
| 25% FW         | 7.08          | 7.17        | 314 ± 24  | 11.2 ± 1.0  | 63.3 ± 1.0                         |
| 50% FW         | 7.20          | 7.18        | 379 ± 24  | 19.1 ± 1.4  | 64.7 ± 0.7                         |
| 75% FW         | 7.29          | 7.20        | 453 ± 37  | 39.5 ± 3.0  | 66.5 ± 0.9                         |
| 90% FW         | 7.38          | 7.31        | 436 ± 54  | 62.4 ± 7.7  | 68.5 ± 0.9                         |
| 100% FW        | 7.30          | 7.34        | 478 ± 38  | 134.8 ± 10.8  | 67.5 ± 2.1                         |

Values are mean plus/minus estimated standard error of triplicate incubations. Standard error for pH were negligible and are not reported here. Methane yield metrics are based on cumulative values at the end of the 35-day incubation; methane content is average of last 15 days of experiment.



**Figure S1.** Top: Regression of cumulative specific methane yield with %FW; Bottom: Regression of cumulative volumetric methane yield with %FW. Error bars show one standard error of triplicate experimental treatments. Cloud shows 95% confidence interval.