**Supplementary material**

**Table S1.** Kinetic parameters obtained for the first order model in the BMP tests at each condition, where S/X is the substrate to inoculum ratio, *Gmax* is the maximum methane volume accumulated at an infinite digestion time; *k’* is the apparent kinetic constant for methane production, and r2 is coefficient of determination.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **S/X** | **Size** | ***Gmax*** **(mL)** | ***k’*** **(d-1)** | **Methane production rate****(mL/(g VS·d))** | **r2** |
| **Prior pH amendment** | 2.00 | 0.25 | 61.53 | 0.24 | 1.06 | 0.910 |
| 2.00 | 1.00 | 41.42 | 0.23 | 0.68 | 0.932 |
| 3.00 | 0.25 | 72.82 | 0.17 | 0.77 | 0.977 |
| 3.00 | 1.00 | 60.73 | 0.19 | 0.68 | 0.937 |
| 4.00 | 0.25 | 59.53 | 0.17 | 0.59 | 0.944 |
| 4.00 | 1.00 | 44.67 | 0.09 | 0.24 | 0.931 |
| **After pH amendment** | 2.00 | 0.25 | 56.39 | 0.28 | 1.13 | 0.916 |
| 2.00 | 1.00 | 37.61 | 0.27 | 0.73 | 0.935 |
| 3.00 | 0.25 | 100.27 | 0.33 | 2.03 | 0.990 |
| 3.00 | 1.00 | 99.38 | 0.26 | 1.59 | 0.966 |
| 4.00 | 0.25 | 137.77 | 0.06 | 0.50 | 0.967 |
| 4.00 | 1.00 | 332.00 | 0.01 | 0.26 | 0.993 |

*VS, total Volatile Solids*