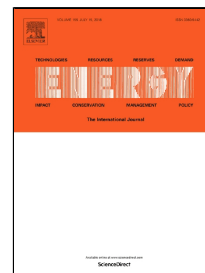


Accepted Manuscript

Effects of liquid fraction of digestate recirculation on system performance and microbial community structure during serial anaerobic digestion of completely stirred tank reactors for corn stover



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PII: S0360-5442(18)31147-2
DOI: 10.1016/j.energy.2018.06.082
Reference: EGY 13124
To appear in: *Energy*
Received Date: 11 November 2017
Accepted Date: 13 June 2018

Please cite this article as: YuQian Li, ChunMei Liu, Akiber Chufo Wachemo, XiuJin Li, Effects of liquid fraction of digestate recirculation on system performance and microbial community structure during serial anaerobic digestion of completely stirred tank reactors for corn stover, *Energy* (2018), doi: 10.1016/j.energy.2018.06.082

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1 **Effects of liquid fraction of digestate recirculation on system performance**
2 **and microbial community structure during serial anaerobic digestion of**
3 **completely stirred tank reactors for corn stover**

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12 **Abstract**

13 Several completely stirred tank reactors (CSTRs) connected in series for corn stover
14 anaerobic digestion was devised to obtain more methane yield and increase conversion rates.
15 Liquid fraction of the digestate (LFD) was recirculated from the second-stage reactor to first-
16 stage reactors to reuse LFD and improve system performance. LFD recirculation didn't
17 inhibit methane production of serial digestion, and methane and biogas production were
18 increased by 2.3% and 10.8%, respectively. Moreover, LFD recirculation increased pH and
19 alkalinity concentration (AC) and decreased volatile fatty acids (VFAs) concentrations and
20 the ratio of VFAs to AC, which means a significant increase in system stability of anaerobic
21 digestion (AD). Ammonia concentrations gradually increased with LFD recirculation, but
22 was far lower than the inhibition concentration. Microbial analysis indicated that the

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