

Digestion and co-digestion of faecal matter collected from urine diverting dehydrating toilet faeces (UDDT-F) and mixed organic market waste (OMW) was studied in single stage pilot scale mesophilic plug-flow anaerobic reactors at UDDT-F:OMW ratios 4:1 and 1:0. *Escherichia coli* inactivation and volatile fatty acids (VFA) build-up was monitored at sampling points located along the reactor profile. When applying UDDT-F:OMW ratio of 4:1 at 12% total solids (TS), *E. coli* inactivation achieved was 2.3 log times higher than that achieved in UDDT-F:OMW ratio of 1:0. In subsequent trials, a two-stage reactor was researched, applying a UDDT-F:OMW ratio of 4:1 and 10 or 12% TS slurry concentrations. Highest VFA concentrations of 16.3 ± 1.3 g/L were obtained at a pH of 4.9 in the hydrolysis/ acidogenesis reactor, applying a UDDT-F:OMW ratio of 4:1 and 12% TS, corresponding to a non-dissociated (ND)-VFA concentration of 6.9 ± 2.0 g/L. The corresponding decay rate reached a value of 1.6 per day. In the subsequent methanogenic plug-flow reactor, a decay rate of 1.1 per day was attained within the first third part of the reactor length, which declined to 0.6 per day within the last third part of the reactor length. Results show that a two-stage system is an efficient way to enhance pathogen inactivation during anaerobic digestion.