



Pilot-Scale Anaerobic Co-Digestion of Municipal Wastewater Sludge with Restaurant Grease Trap Waste

“Store It, Don’t Pour It” is a common slogan in the City of Edmonton that encourages residents to store unwanted fats, oil, and grease (FOG) in a container and to transfer FOG to a garbage bin destined for landfill disposal rather than pour these substances down the drain. When FOG are poured in drains, they clog sewer lines causing back-ups in homes and potentially the entire neighbourhood. This problem can be smelly, not to mention costly, to clean up.

Imagine this problem a thousand times bigger – the restaurant industry produces large volumes of FOG daily. In the City of Edmonton, there have been 200 blockages annually due to FOG. But separating FOG is only the beginning. Some jurisdictions have banned FOG from entering landfill sites, and therefore alternative processes are needed. One alternative process is anaerobic co-digestion, a process that degrades and stabilizes FOG while producing biogas. Once the biogas is refined and processed, it can be used as a fuel to create energy.



Anaerobic Digestion Pilot Plan

The Edmonton Waste Management Centre of Excellence (EWMCE), EPCOR and the University of Alberta (with support from CDM Smith and WERF) partnered to investigate the biogas production through the anaerobic co-digestion of wastewater sludge and grease trap waste (GTW), which is a form of FOG. The goal was to determine the optimal amount of GTW that could be co-digested and to produce the highest amount of biogas without upsetting the digestion process. Results showed that the optimal amount of GTW was 23% of the total volatile solids (or 58% of the total chemical oxygen demand). This optimal amount also increased biogas production by 67% compared to wastewater alone.

Conclusively, this study demonstrated anaerobic co-digestion of FOG with municipal wastewater sludge increases biogas production. The study suggests that FOG has the potential to become part of the waste to energy cycle (waste to resource, resource to energy) when combined with another waste resource such as wastewater sludge. This is yet another example of how waste can be recovered and how diversion strategies such as co-anaerobic digestion become part of the resource recovery cycle.

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