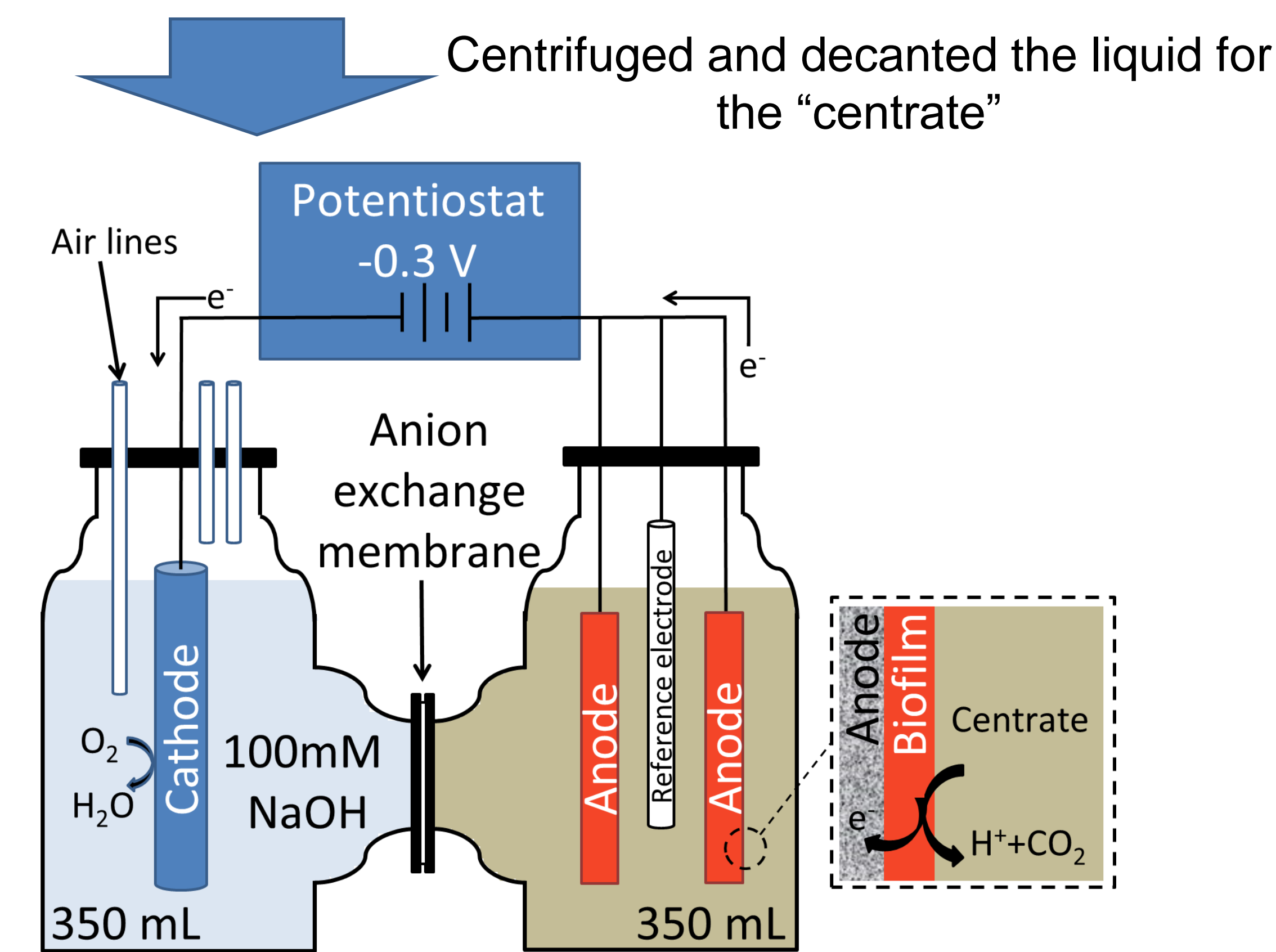


Conclusions

Microbial fuel cells (MFCs) are effective alternatives as biosensors to detect anaerobic biodegradability when different waste-activated sludge (WAS) centrates are hydrolyzed and consumed by anaerobic microorganisms

Experimental design

WAS Pretreatments	Control	Pulsed-electric field (PEF)
	No treatment	OpenCel α unit at 29-30 kV
Alkaline	pH adjusted to 12 for 24 hours then returned to pH 7	Thermal
		Autoclave at 121°C for 30 min.



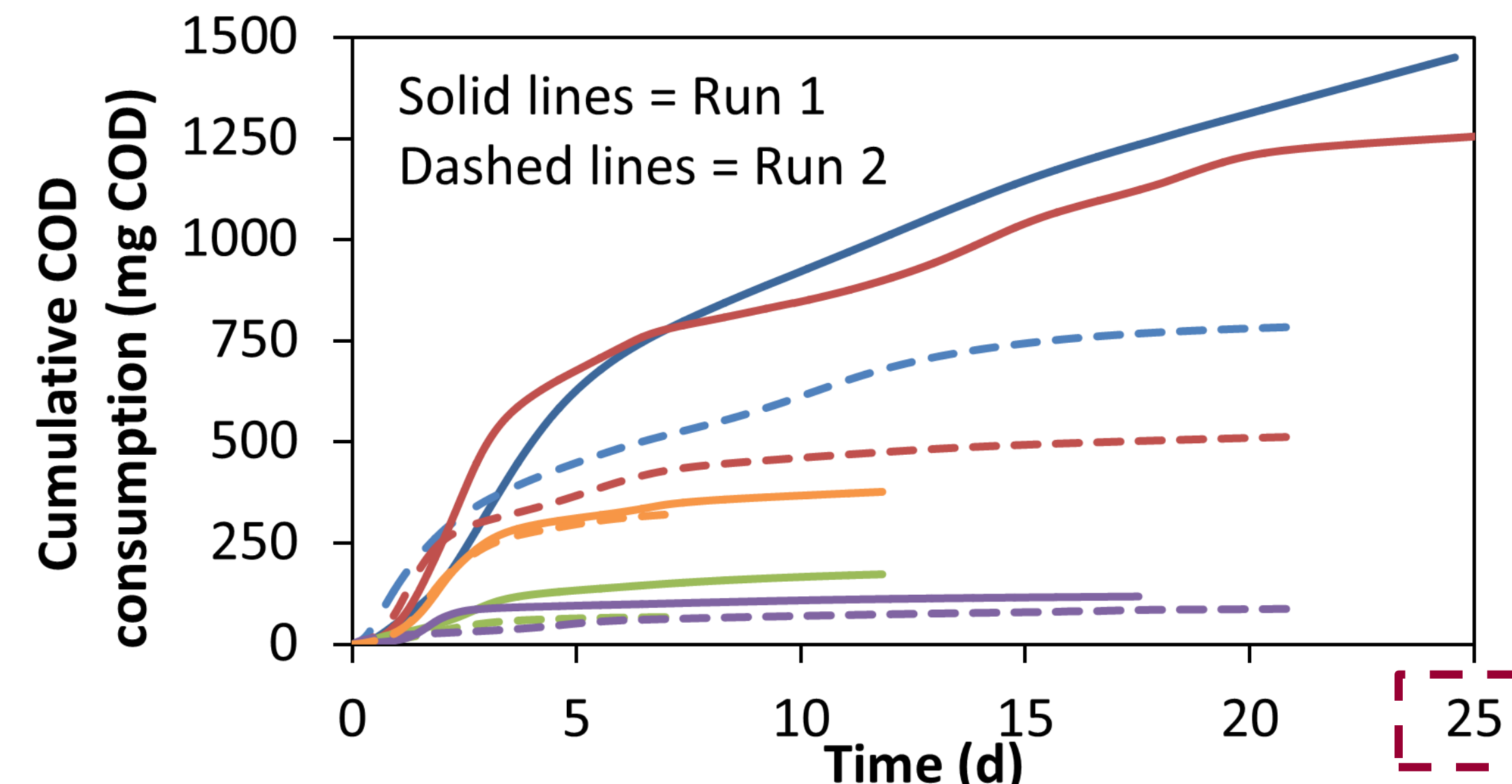
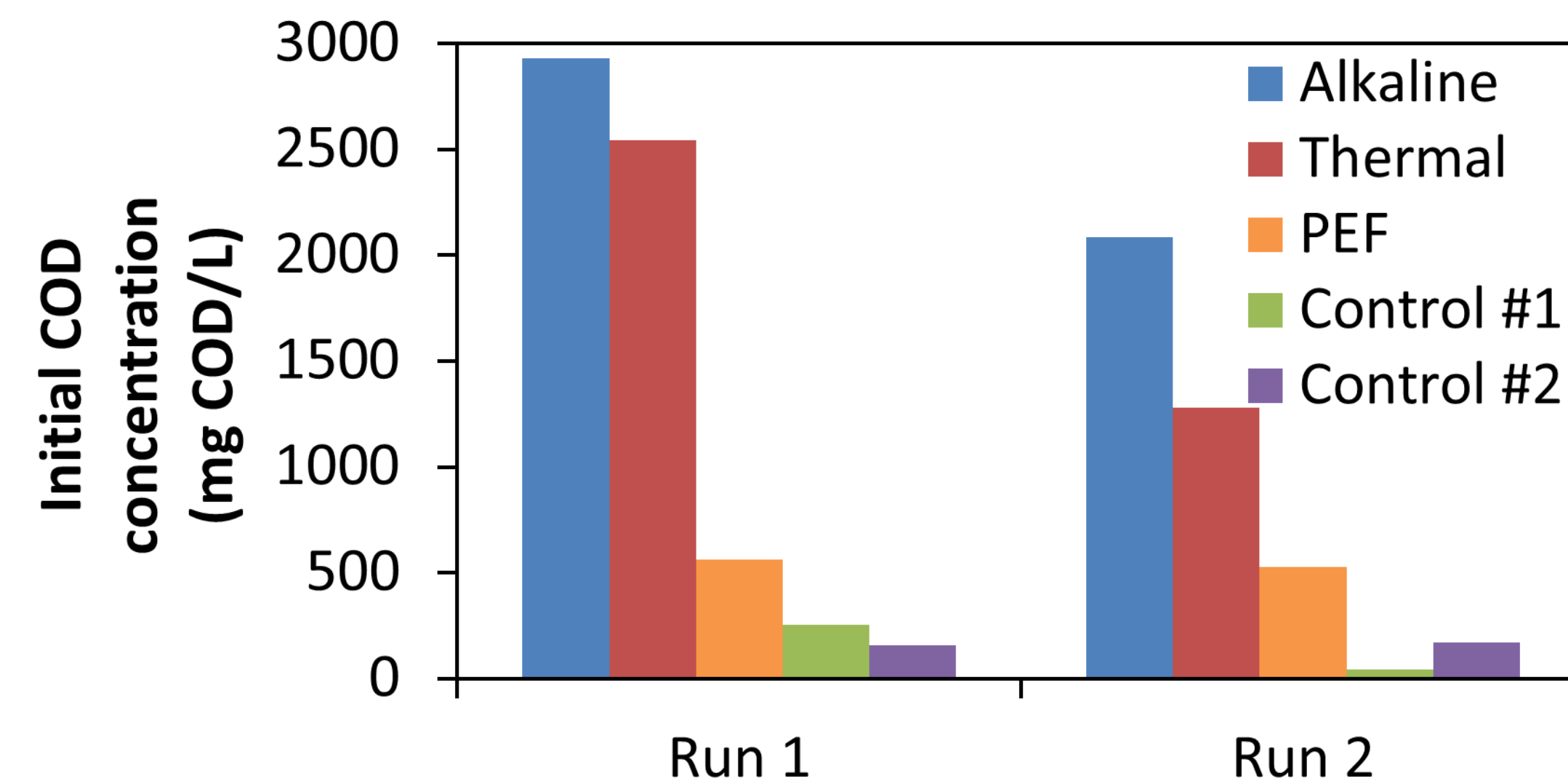
$$\text{COD} = \text{Electric charge with time (A-s)} * \frac{\text{mol e- eq.}}{96485 \text{ A-s}} * \frac{8000 \text{ mg COD}}{\text{mol e- eq.}}$$

Background

Biochemical Methane Potential (BMP) tests are commonly used to evaluate the substrate biodegradability. BMPs have three major drawbacks: (1) BMPs tests require a minimum of 45 days; (2) BMPs lack short time resolutions to determine hydrolysis rates or identify different hydrolysis events as they occur; and (3) BMPs utilize anaerobic digester inoculum that contains residual COD, which can result in overestimating methane production.

Results

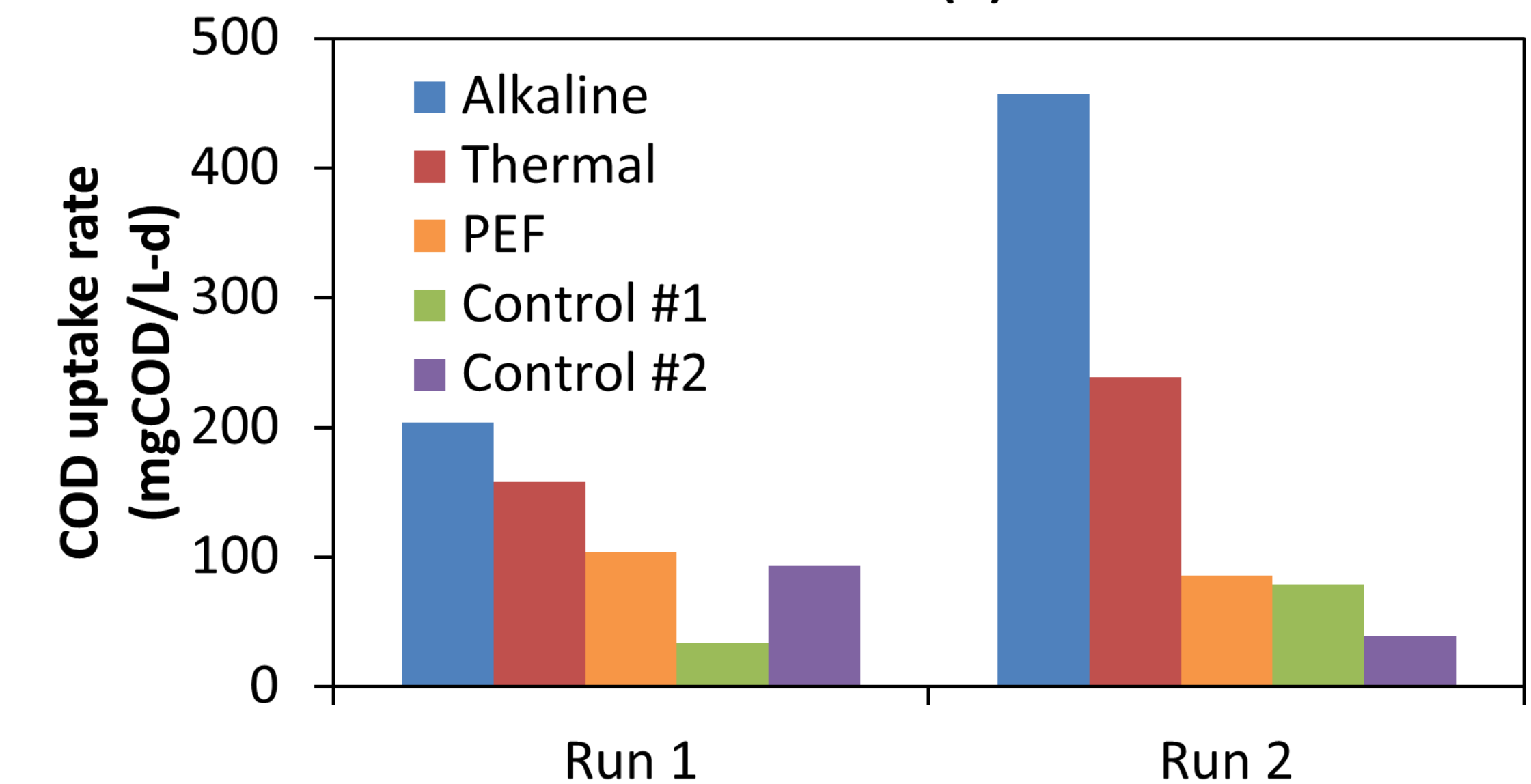
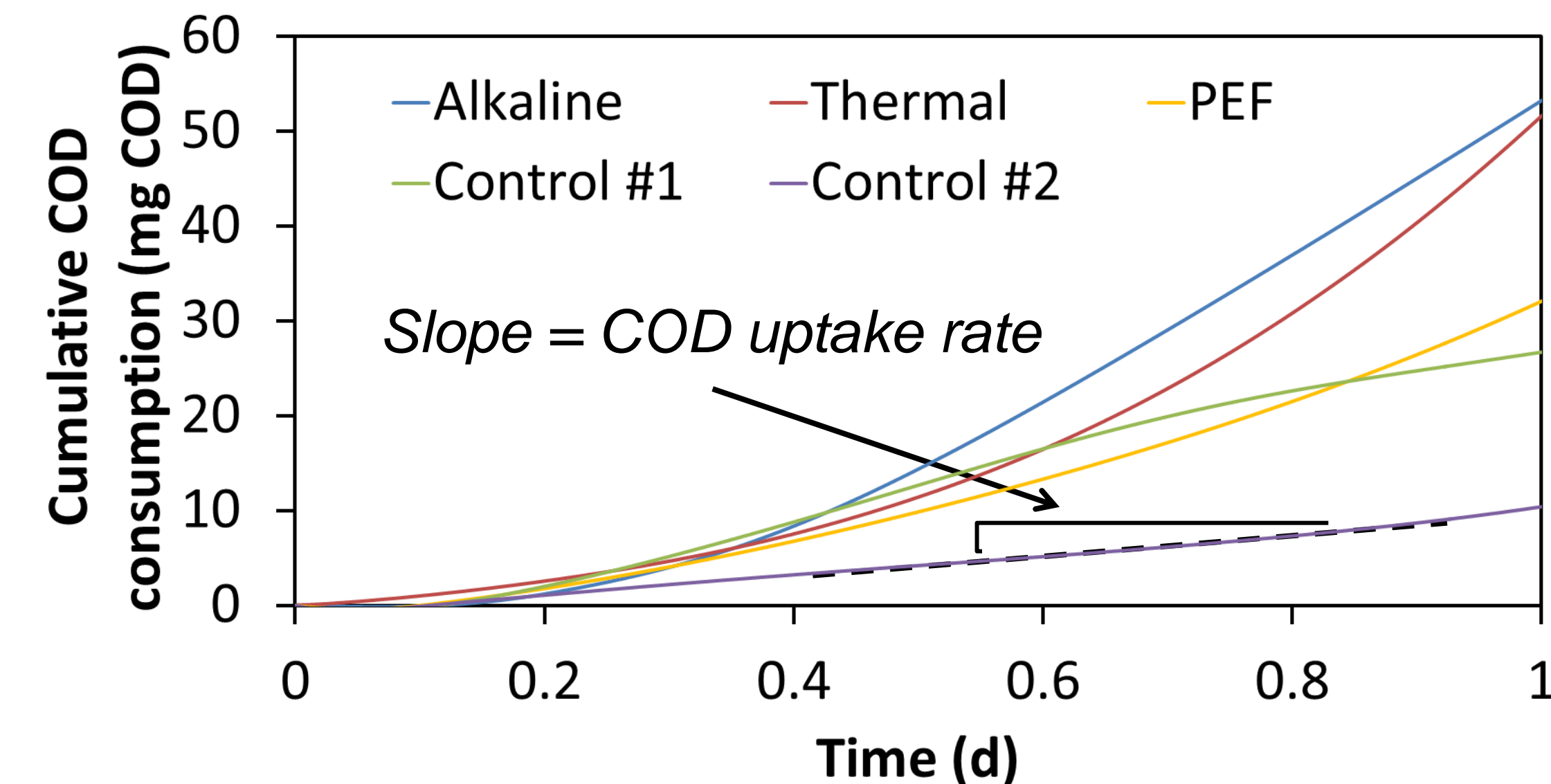
The larger amount of initial amount of COD available, the more COD detected in the MFC



—Alkaline —Thermal —PEF —Control #1 —Control #2

Results

The MFCs' time resolution is useful for determining different hydrolysis or uptake rates



Acknowledgements

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