

EVALUATION OF *SCENEDESMUS OBLIQUUS* GROWTH PERFORMANCE ON DIFFERENT TREATED DIGESTATES

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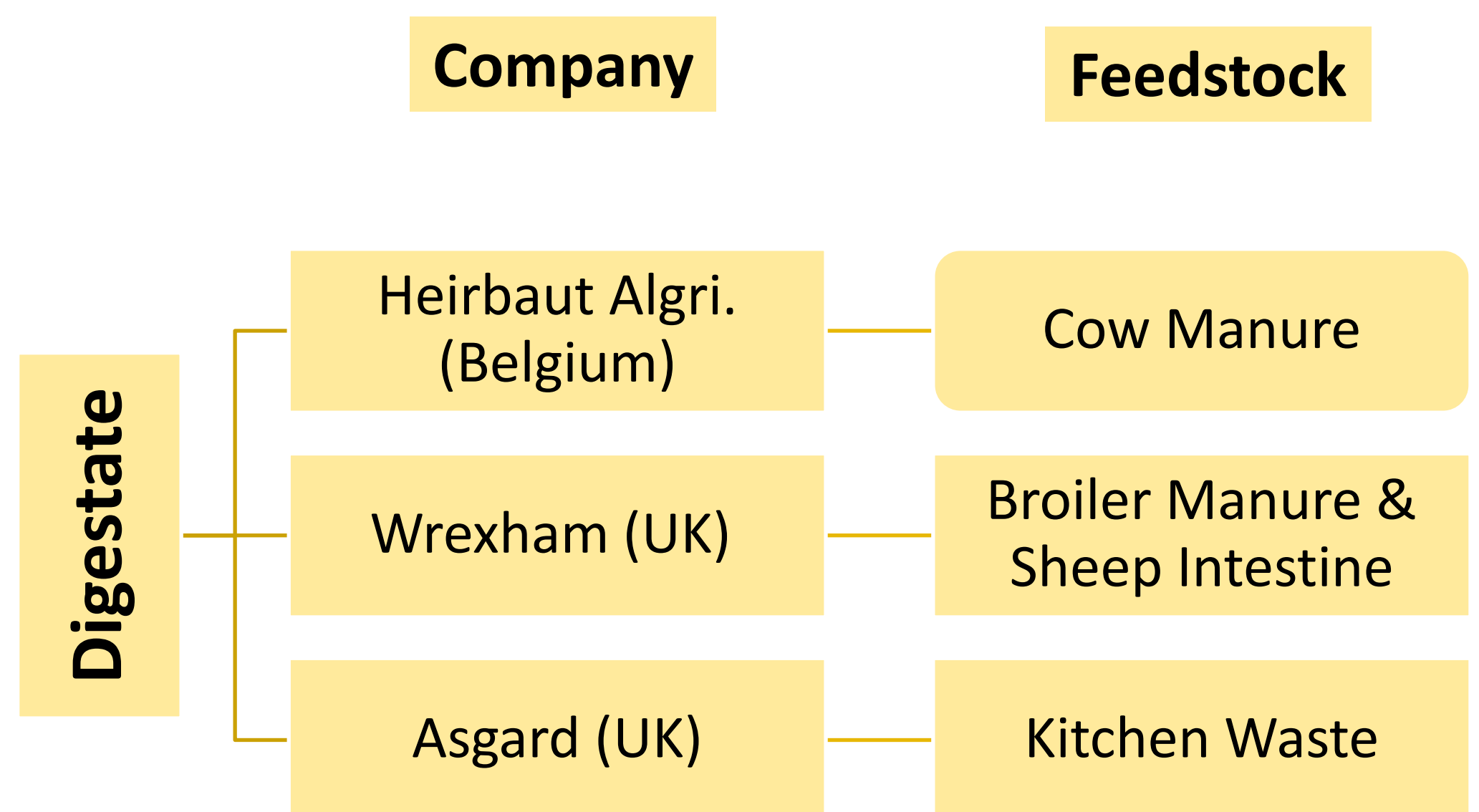
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1. Introduction

Although digestate is a nutrient rich and cost-effective substrate for the cultivation of microalgae, the composition is needed to be analysed before its utilisation. Furthermore, the quality of algal growth will depend on the used digestate and its provenance (feedstock and other conditions) as well as how it has been pre-treated prior to its use as a media for microalgal cultivation.

2. Materials & Methods

- Three types of digestates from different sources and feedstocks were investigated and pre-treated, to be used as a source of Nitrogen (N) and Phosphorus (P) for microalgal cultivation.
- Dry weight (in g.L^{-1}), Ammonium ($\text{NH}_4\text{-N}$), and phosphorus (PO_4^{3-}) were analysed. The elemental composition of the digestates was measured using Rigaku instrument X-ray fluorescence (XRF).
- A hollow fibre membrane with a pore size of $0.2 \mu\text{m}$ was used to pre-treat the three types of digestates.



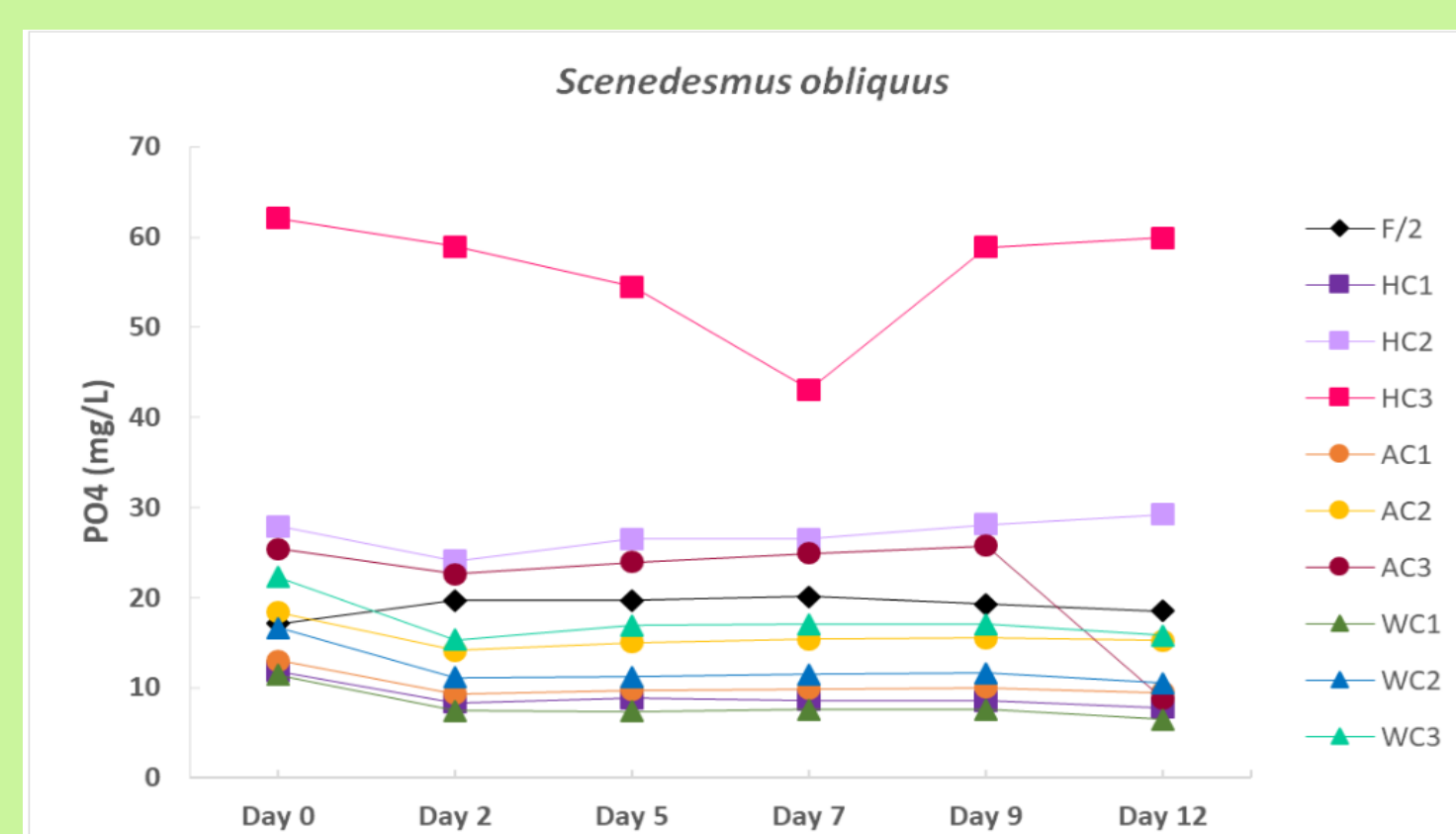
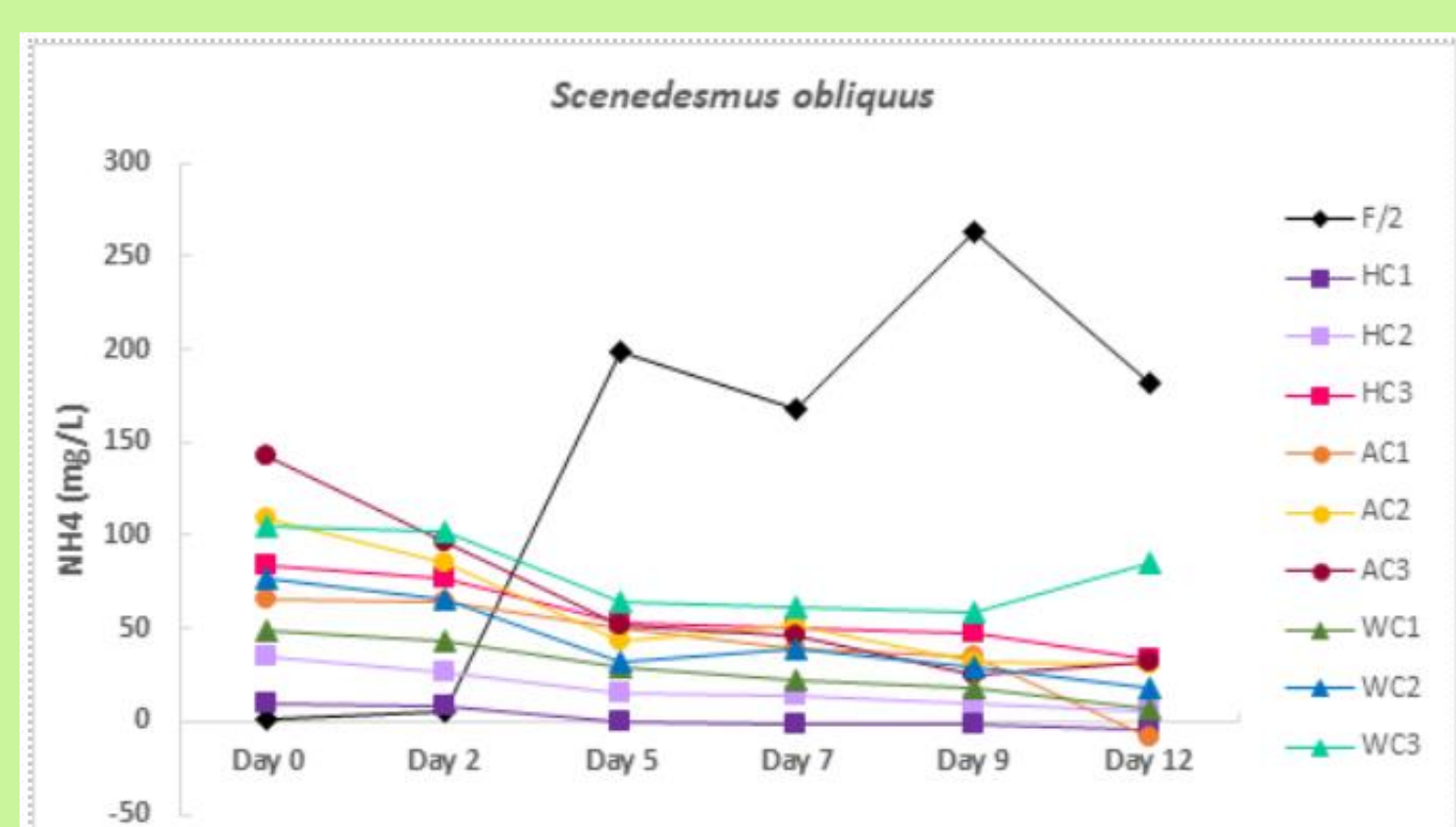
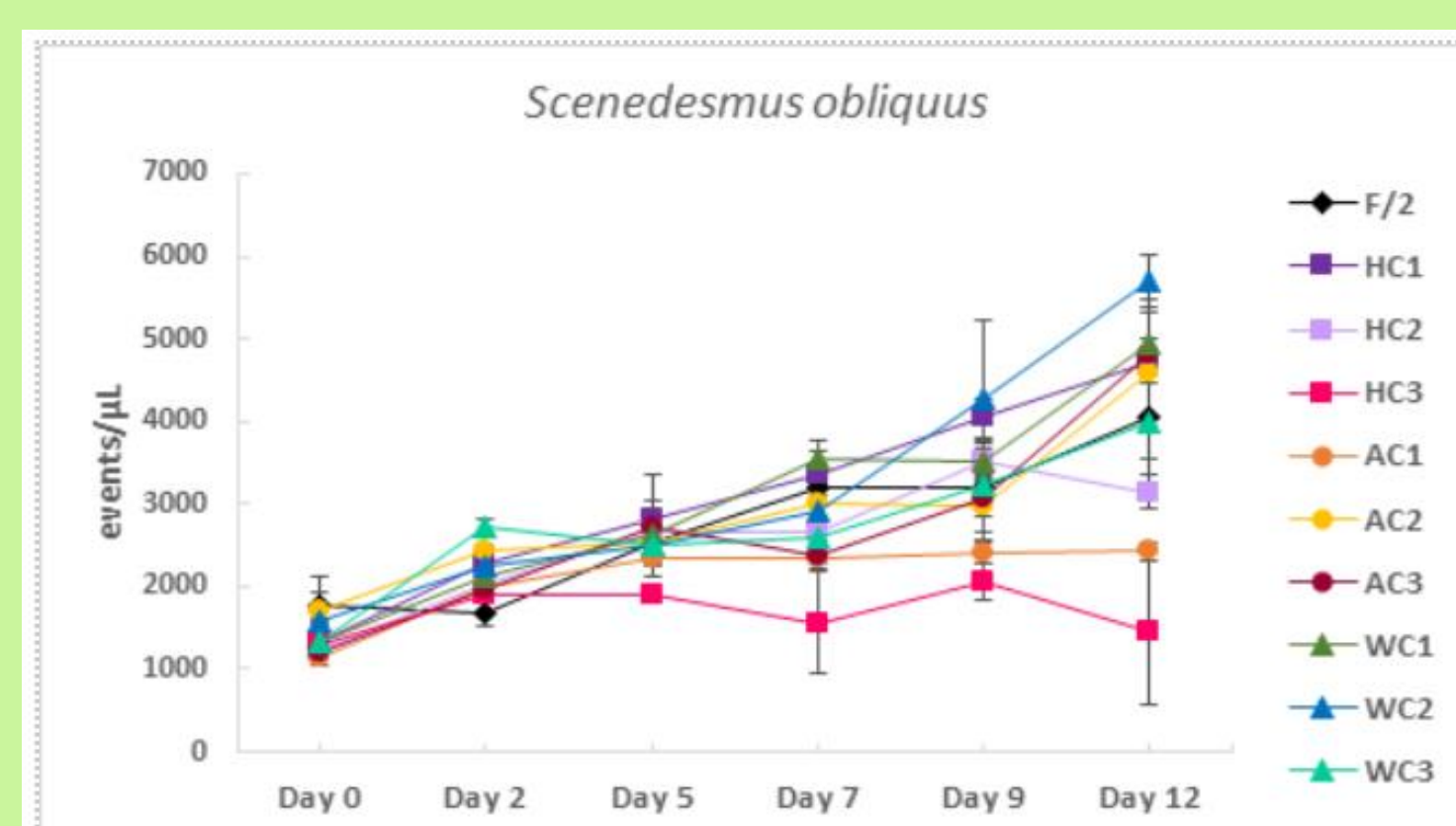
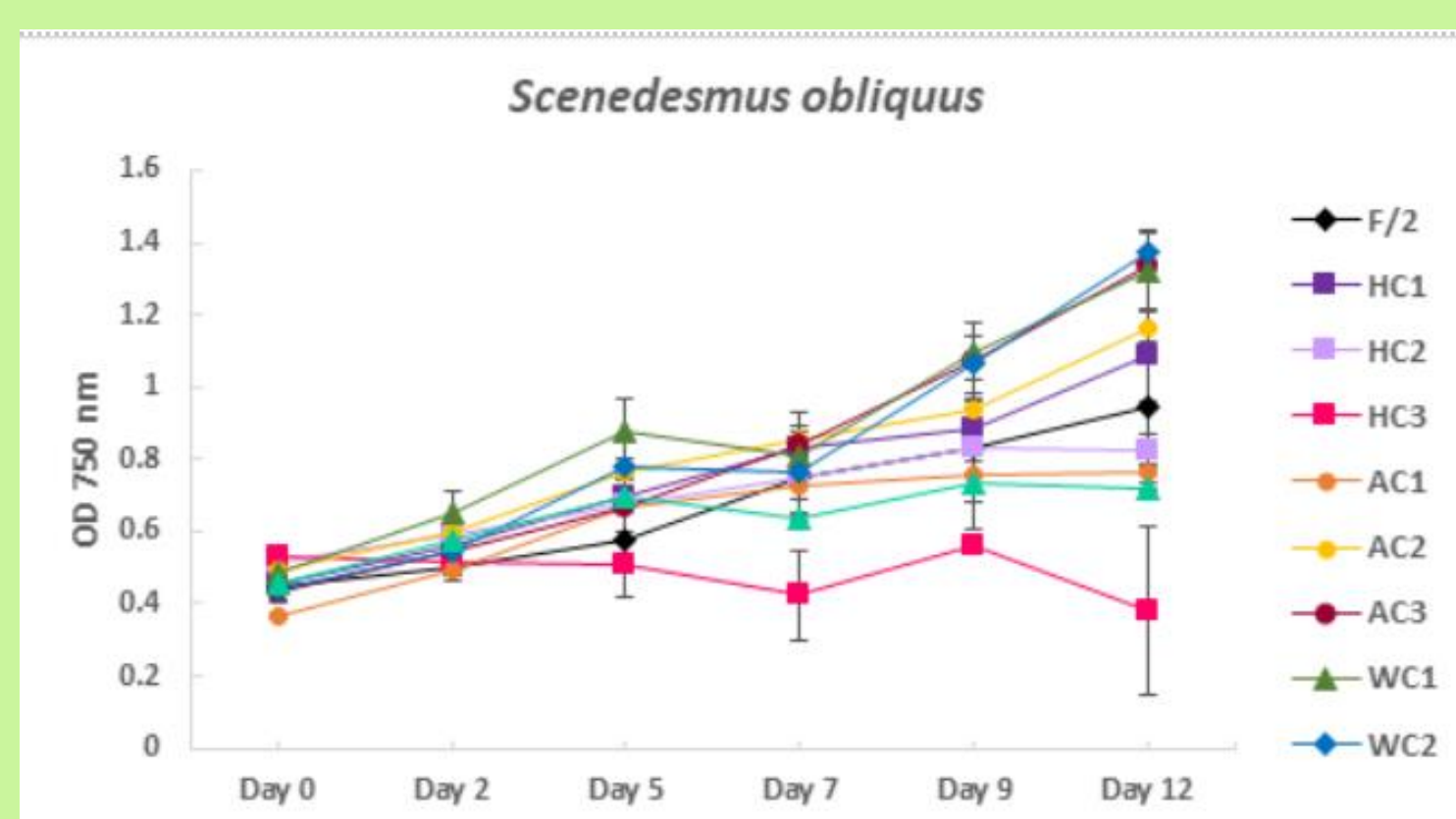
3. Results

- Elemental analysis of the digestates showed high concentrations of Sodium, Potassium and Calcium in the tested samples, but none of the harmful metals or elements were found in significant concentrations.



	Heirbaut	Wrexham	Asgard
NH_4^+	797.8 ± 18.4	1786.7 ± 108	2406.2 ± 414.9
PO_4^{3-}	622.1 ± 8.8	660.3 ± 9.1	880.4 ± 9.8
DW	7.2 ± 0.7	24.7 ± 0.8	18.2 ± 1.2
N:P	1.3	2.7	2.7
Potential dilution required	8	18	24
Potential percentage used	12.50%	5.50%	4%

- *Scenedesmus obliquus* cultures were grown in 1L bottles using three digestates as a source of nutrients, tested at 3 different concentrations, and in triplicate against F/2 medium as a control. The ammonium concentrations of 50, 25, and 10 mg.L^{-1} were used for algal cultivation.



4. Conclusions

- *Scenedesmus* cultures performed well on the Heirbaut digestate, at concentrations of 25 and 10 mg.L^{-1} of ammonium.
- We also found that the Heirbaut digestate had less of the oligo elements used in microalgal growth, such as iron and zinc. Hence potential supplementing the treated digestate with a metal solution could increase algal growth and consequently the amount of digestate used for remediation will be higher.

