

Bioenergy 2020: Investigating the role of parameters in dairy wastewater treatment with VSEP ultrafiltration

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Protecting our natural environment has never been more urgent than nowadays. Increase implies a rise in consumption which makes a continuing threat for nature from various pollutants. Our drinking waters indirectly and living waters are directly exposed to the effect of varied wastewaters from industrial activities. To treat these wastewaters effectively a correct method might be membrane filtration because it's a promising method in some ways though membrane fouling remains a limiting factor. During this study vibrational ultrafiltration and therefore the operating parameters were examined so as to supply an answer for reducing membrane clogging. Experiments were administered monitoring operational parameters, vibrational amplitude (Avibr.) and transmembrane pressure (TMP), with model dairy wastewater, for vibratory shear enhanced processing (VSEP) ultrafiltration. Both Avibr. and TMP were gradually adjusted at different levels, which were selected supported our previous research. Permeate fluxes, chemical oxygen demand, total dissolved solids, pH and

electric conductivity were measured and membrane rejections were calculated. Analysis of variance was implemented so as to research the consequences for efficiency of each individual operational parameter. Furthermore, calculations are made for clarifying the possible change in specific energy demand as an economic outcome of applied vibration. Results show that membrane rejections might be maximised at a limiting pressure value, as a result, fine-tuning of operational parameters can eventuate far more efficient performance. Summarizing module vibration significantly decreased membrane fouling that's promising for a good wider use of the technology. Acknowledgements: Authors are grateful for the support of the Hungarian State and therefore the European Union (EFOP-3.6.2-16-2017-00010 – RING 2017) and therefore the project Hungarian Science and Research Foundation (OTKA contract number K 115691). Supported by the ÚNKP-19-2 New National Excellence Program of the Ministry for Innovation and Technology.