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## DAIRY WASTEWATER UTILIZATION BY COMBINATION OF OXIDATION PRE-TREATMENT AND ULTRAFILTRATION

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### Abstract

In this work the effects of oxidation pre-treatments (ozonation and Fenton reaction) on membrane filtration of dairy wastewater were investigated, together with the further utilization possibilities of residual wastes. The oxidation pre-treatments enhanced the membrane filtration efficiency, from which the short-term ozone treatment was found to be the most effective method both in terms of increasing the flux and the pollutant removal efficiency. After ozone pre-treatment the phosphate and ammonium content of the wastewater migrated to the permeate, while after Fenton pre-treatment the phosphate content remained in the concentrate, and the ammonium content in the permeate decreased. The concentrate was utilized as biogas resource and it was found that both pre-treatments increased the biogas production and its methane content as well. Based on our results it can be concluded that ozone pre-treatment combined with membrane separation have improved the efficiency of dairy wastewater treatment and may suit the requirements of circular economy.

**Keywords:** biogas, dairy wastewater, ozone, pre-oxidation, membrane separation

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