

IMPROVING RESIDUAL WATER WITH A BIODIGESTOR ON A DAIRY FARM IN NORTHERN MEXICO

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Abstract. Intensive animal production enterprises represent welfare to soil, as well as to ground and surface water. In particular, livestock production generates large quantities of waste and residual water, and as consequence can have negative effects to the environmental as a whole. The objective of this study was to quantify the differences between influent and effluent waters in the context of using a bio digester on a dairy farm in northern Mexico. Eight water samples were collected in the summer of 2016. Both influent and effluent were collected with each sampling. The variables pH, temperature (T), electric conductivity (EC), total dissolved solids (TDS), biochemical oxygen demand (DBO₅), chemical oxygen demand (COD), methane (CH₄), carbon dioxide (CO₂) and hydrogen sulfide (H₂S) were quantified. The variables pH, EC and T were measured *in situ* using a Hanna instruments Model HI-981-30. As well, the TDS were evaluated *in situ* with a TDS_t OAKTON Instrument. DBO₅ and COD were determined in the laboratory of the Engineering School of the Autonomous University of Chihuahua, Mexico. Finally, the parameters CH₄, CO₂ and H₂S were quantified *in situ*. A paired difference was performed to detect differences in water using a significance level of 0.05 ($\alpha=0.05$), and confidence intervals for mean differences were calculated. There were no statistically significant differences for the parameters pH, EC, TDS, CH₄ and CO₂ ($P>0.05$). However, statistically significant differences were found for T, H₂S, DBO₅ and COD ($P<0.05$). We conclude that the bio digester helps in purifying influent water in a Mexican dairy farm.

Key Words: Bio digester, Chihuahua, animal production

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