



## Characterization of wastewater from dairy industry in Palestine and its adsorption on biowaste

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### ABSTRACT

This study aims at determining the pollution loads of wastewater discharged from local Palestinian dairy factories. Wastewater samples were collected from different dairy processes and pollution loads were determined. Furthermore, the technical feasibility of using adsorption process for treating such a wastewater was investigated using stirred batch and continuous packed-bed adsorption experiments with sawdust and activated carbon as adsorbents. Approximately, 477,000 m<sup>3</sup> of dairy wastewater in Palestine is annually discharged without proper treatment. The average measured chemical oxygen demand (COD) is 68,000 mg/L and the average total suspended solids (TSS) is 188,000 mg/L, which are much higher than values reported in the literature. The annual pollution loads released from the dairy industry in Palestine is estimated as 22,180 ton of COD, 210 ton of total dissolved solids, and 8,080 ton of TSS. Batch adsorption results showed that activated carbon particles requires more than 18 h to reach equilibrium while only 2 h are required in the case of sawdust adsorbents. However, both adsorbents achieve almost the same COD removal efficiency of about 65%. For the continuous packed-bed adsorption, increasing the bed height, increases the adsorption efficiency and the time required for the saturation of the adsorbent.

*Keywords:* Adsorption; Dairy wastewater; Wastewater treatment; Sawdust; Activated carbon

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