Characterization of Effluent Water from Dairy and Meat Processing Industry in Sri Lanka

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Industrial wastewater entering a water body represents a heavy source of environmental pollution. Wastewater from food industries causes pollution problems due to its high Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). Compared to other industrial sectors, food industry requires great amounts of water. The main environmental problem of the food industry is that the wastewater resulting from their activities does not meet the limits of the environmental regulations for the discharge of wastewater to the environment. The main objective of this study is characterization of wastewater from dairy and meat processing industries in Sri Lanka through analysis of physical and chemical parameters (BOD, COD, pH and electrical conductivity). Wastewater samples were collected from three dairy and meat processing companies at different days and 3 replicate measurements were taken from each sample. For all the analysis, APHA methods were followed. Ranges of BOD, COD, pH and electrical conductivity of wastewater respectively were 111.33±5.51-1303.30±12.70 mg L^{-1}, 1616.70±57.70-6400.00±229.00 mg L^{-1}, 5.30±0.12-7.70±0.12 and 0.39±0.01-1.78±0.01 Sm^{-1} in dairy industry and 134.33±2.31-1206.70±58.60 mg L^{-1}, 3017.00±231.00-12720.00±0.01 mg L^{-1}, 6.60±0.15-9.69±0.03, 0.43±0.01-2.44±0.02 Sm^{-1} in meat processing industry. Physicochemical properties of wastewater all mean values among dairy and meat processing industry were significantly different ($p<0.05$). The study also showed that wastewater from meat processing industry had a higher BOD and COD compared to that from dairy industry. Further, BOD and COD showed no linear relationship with pH and electrical conductivity ($p<0.05$) and there may be nonlinear relationship between BOD, COD and other parameters. The dairy and meat effluent has excess BOD and COD than the limits of environmental regulation (p value<0.05), therefore, suitable treatment process and dilution process is required before discharging to the environment.

Keywords: Wastewater, Biochemical oxygen demand, Chemical oxygen demand, Dairy, Meat processing industry.