

In situ and laboratory scale dairy plant waste water Treatment by using Effective Microorganisms

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Abstract

The dairy unit of Kasetsart University, established 36 years ago was the first modern unit of its kind in the kingdom of Thailand. The plant produces 17 tons/day of pasteurized and a number of fermented milk and generates an average of 65 m³ of wastewater with very high BOD, COD and total volatile solids accounting for 3319, 4767 and 1234 mg per litre, respectively. Semi-continuous mass culture of EM was carried out and extended EM was utilized for in situ treatment of the plant wastewater. In the treatment process, mixture of extended EM and water at a ratio of 1 : 20 was sprinkled on the surface of the first reception pond twice daily. Within a few weeks, there was a significant reduction of smell and environmental problems of crust formation on the surface. Analysis of wastewater revealed the BOD removal of 80% at the first pond and 94% at the second pond, COD removal of 79% and 93% and total volatile solids removal of 78% and 95%.

After 3 years of continuous operation, effects of the treatment using EM were re-evaluated both in situ ponding condition and in laboratory scale experiment. For in situ treatment of the plant wastewater, study which involved 2-month period yielded the average BOD reduction of 62% at the first pond and 94% at the second pond. The respective COD reductions were 74% and 95%. Two bench scale reactors simulated the plant wastewater treatment ponds were used in laboratory experiment. Results obtained for one-month comparative study of the performance characteristics of the reactor which was applied with EM twice daily to those of the other reactor which was served as control verified the beneficial effects of EM, reductions of BOD and COD were 40-58% at the first pond and 60-75% at the second pond.

Key words : dairy wastewater, wastewater treatment, EM, Effective Microorganisms