ABSTRACT

Jensen,P.W.; Kalstrom, D.L.; Carlson, J.L.: Minn-Dak Farmers Cooperative, 7525 Red River Road, Wahpeton, ND 580756. Aerating Suspended, Anaerobic Biomass To Improve Solid-Liquid Separation.

Until 1990, the anaerobic, continuous contact reactor experienced a number of problems, chronic loss of biomass, settling of biomass in the tank and sever upset. These problems and addition of yeast wastewater to the existing system, prompted two design changes in the summer of 1990: A third tank stirrer, and an aerator between the anaerobic tank and the clarifier to stun the microbes preventing gas production in the clarifier and to degas the sludge. Performance was monitored as follows: Biomass retention-total suspended solids (TSS), sludge density-sludge volume index (SVI), and digester performance-chemical oxygen demand reduction (COD%R) and hydraulic rate (millon gallons per day (MGD)). After implementing the changes the following improvements were noted: 1.Increased biomass (TSS: 300ppm, 2/90; 1200ppm, 2/91). 2.Increase sludge density (SVI: 150ml/g, 2/90; 25ml/g, 2/91). 3.Increased performance: (COD%R: 96 @ 0.6MGD, 1/90; 94 @ 1.0MGD). During the 1991-92 campaign the aerator was used for only three weeks as it caused a degradation of the above parameters. Since 1991, sludge retention, sludge density and anaerobic system performance has been similar to what it was in 1990-91 even though the aerator has not been operated. It has been concluded that the nature of the mixed, beet and yeast wastewater produces the desirable sludge properties. Some evidence indicates the aeration in 1990-91 was beneficial. Two problems associated with the aeration were odor and deposition of scale. When the tank was drained for maintenance in the 1991, significantly less sludge was found than in previous years. This suggests the third stirrer was effective in preventing the biomass from settling in the digester.