Geethu Kurup et al., J Environ Anal Chem 2018, Volume 5
DOI: 10.4172/2380-2391-C1-002



# Recovery of value adding organic components from dairy wastewater using food grade low-cost organic lignosulphonate

**Geethu Kurup, Benu Adhikari and Bogdan Zisu**
RMIT University, Australia

The dairy sector is one of Australia's largest agricultural industries with an annual milk production of 9.02 billion liters. It is also one of the largest effluent producing industries and poses considerable challenges in environmental waste management due to high Biological Oxygen Demand (BOD). The objective of this research is to use a low-cost food grade organic polymer to recover value adding components including milk proteins and dairy fats to reduce the high BOD in acidic dairy effluent. The sodium salt of lignosulphonate is a low-cost organic by-product from the wood pulping industry and this polymer has industrial applications as a pellet binder in cattle feed stock and in egg and meat waste management. This anionic polymer has potential application in dairy waste treatment by binding positively charged proteins in acidic conditions forming complexes which are easily recovered by sedimentation. The polymer also can trap fat molecules which are insoluble in acidic condition and conglomerate with the protein-lignosulphonate complex. At an optimum concentration of 0.016% addition and at pH 3.5, Na-lignosulphonate reduces the turbidity of dairy wastewater by 98% at both ambient temperature (22±2 °C) and 40 °C. There is a significant reduction ($p<0.05$) in biological oxygen demand by 73.75% at 22 °C and 70% at 40 °C. This is due to the removal of organic components including proteins (46%) and fats (96%) from the dairy waste stream. SDS-PAGE analysis reveals that out of the 46% total protein recovered, 90% was caseins and 10% whey proteins. The remaining 54% of the total soluble proteins were predominantly whey protein. The recovered organic complexes rich in dairy protein and fat have potential value adding uses in subsequent feed stock manufacture.

## Biography

Geethu Kurup is currently pursuing her PhD in water treatment from School of Science, RMIT University, Australia. She has completed her Master's degree in Chemical Engineering. Presently, she is undertaking research to develop a sustainable approach to reduce the environmental impact of dairy sector.

s3574690@student.rmit.edu.au

**Notes:**