IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, March 2022
Impact Factor: 6.252

Biogas as a Value Generation from Dairy Industrial Waste Water

Shareen Fathima M, Hiritha N, Mounika M, Sureja A, Prabhu N*
Department of Biotechnology
Vivekanandha College of Engineering for Women, Elayampalyam, Tiruchengode, Tamil Nādu, India
*Corresponding Author: prabhu.aut.26@gmail.com

Abstract: *Dairy industry wastewater has a high chemical oxygen demand, a high biological oxygen demand, nutrients, and organic and inorganic components. If these wastewaters are not properly treated before being released, they will significantly contaminate recipient water bodies. There are various physical, chemical, and biological techniques for treating dairy waste water. Dairy waste, on the other hand, responds well to biological treatment. When microorganisms come into touch with the strongly aerated effluent, they oxidise the organic stuff to carbon dioxide and water. Microorganisms convert organic materials to biogas and cell biomass in anaerobic processes. Anaerobic digestion is a complicated chemical and biological process that is influenced by a variety of variables. Biogas is a renewable energy source that can be used as a long-term replacement for fossil fuels. The major objectives of this paper is to examine Bio-gas Generation and variables impacting Bio-gas Generation from dairy industry wastewater, such as pH, temperature, alkalinity, and so on, in order to maximise biogas release by biological breakdown. Biogas is the cheapest renewable energy source created in an engineered fashion from dairy sector effluent, according to the results.*

Keywords: Industrial Waste Water, Types, Dairy Waste Water, Anaerobic Digestion, Biogas Production

REFERENCES

[1]. Srinivasan G.,2009, "A Study on Dairy Wastewater Using Fixed-Film Fixed Bed Anaerobic Diphasic Digester" American-Eurasian Journal of Scientific Research 4 (2): 89-92.
[2]. GotmareMonali, R.M.Dhoble, A.P.Pittule, "Biomethanation of Dairy Waste Water Through UASB at Mesophilic Temperature Range" (IJAEST @2011, Vol.8 Issue 1, 001-009.
[3]. Ramesh T. "Performance evaluation of fixed Bed fixed film anaerobic Bioreactor for treating dairy effluent" Jr. of Industrial Pollution Control 23 (1)(2007) pp 11-14
[4]. Deshannavar U. B., Basavaraj (2012), High rate digestion of dairy industry effluent by upflow anaerobic fixed-bed reactor, Journal of Chemical and Pharmaceutical Research, 4(6):2895-2899
[5]. Nattushrirame ,Environmental engineer,2017).
[6]. Arthur.R, Baido.M.K and Antwi.E (2011), "Biogas as a potential renewable energy source", a Ghanian case study, Renewable energy, vol.36, pp.1510-1516.
[7]. M.N. Rao and A.K. Datta (2012).," waste water treatment ", third edition.pp.254-258)
[8]. Tawfika A, Sobheyb m, badwya M. trearment of a combined dairynand domestic wastewater in an upflow anaerobic sludge blanket reactor followed by activated sludge (as system). Desalination .2008;227(1-3) : 167 - `177.DOI :10.116/j.desel.2007.06.023.
[9]. Taneryonar,ozgesivrioglu and nihanozengin , physio -chemical treatment of dairy industrial waste water.
[10]. Deshannavar U. B., Basavaraj. R. K (2012), High rate digestion of dairy industry effluent by upflow anaerobic fixed-bed reactor, Journal of Chemical and Pharmaceutical Research, 4(6):2895-2899
[11]. M. Naik (2012), High rate digestion of dairy industry effluent by upflow anaerobic fixed-bed reactor, Journal of Chemical and Pharmaceutical Research, 4(6):2895-2899
[12]. Bhuyar Er. Kiran D., 2013,"Treatment of domestic wastewater in an up flow anaerobic packed bed reactor (UAPBR)" International Journal of AdvancedEngineering Research and Studies, E-ISSN2249–8974, IJAERS /Vol. II/ Issue III/April-June, /122-124, Research Paper

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, March 2022
Impact Factor: 6.252

[13]. SorathiaHarilal S., Dr. Pravin P. Rathod, Arvind S. Sorathiya, "Bio-gasgeneration and factors affecting the bio-gas generation – a review study" International Journal of Advanced Engineering Technology E-ISSN 0976-3945, IJAET/Vol.III/ Issue III/July-Sept, 2012/72-78

[14]. Arthur.R, Baido.M.K and Antwi.E (2011), "Biogas as a potential renewable energy source", a Ghanian case study, Renewable energy, vol.36, pp.1510-1516.

[15]. Chelliapan., S Sallis., P.J (2011), "Performance of an up-flow anaerobic packed bed reactor system treating pharmaceutical wastewater" IPCBEE vol.1 (2011) © IACSIT Press, Singapore.

[16]. Dioha I. J., C.H. Ikeme, T. Nafi'u, N. I. Soba and Yusuf M.B.S., September2013, "Effect of carbon to nitrogen ratio on biogas production", InternationalResearch Journal of Natural Sciences, Vol. 1 No. 3, pp.1 -10.

[17]. Chaudhary Binod Kumar, 2008, "Dry continuous anaerobic digestion of municipal solid waste in thermophilic conditions" A thesis submitted in partialfulfillment of the requirements for the degree of Master of Engineering in Environmental Engineering and Management Asian Institute of Technology, School of Environment, Resources and Development, Thailand .

[18]. Demirel.B and Yenigun.O (2004), "Anaerobic acidogenesis of dairy wastewater, the effects of variations in hydraulic retention time with no pH control".

[19]. Bhadouria, BS and Sai, VS 2011, "Utilization and treatment of dairy effluent through biogas generation- a case study", International Journal of Environment Science, vol.1.

[20]. A.P.Pittule, "Biomethanation of Dairy Waste Water Through UASB at Mesophilic Temperature Range" (IJAEST @2011, Vol.8 Issue 1, 001-009.

[21]. GotmareMonali,"Biomethanation of Dairy Waste Water Through UASB at Mesophilic Temperature Range" (IJAEST @2011, Vol.8 Issue 1, 001-009.

[22]. Gotmare.M, Dhoble, RM and Pittule, AP (2011), "Biomethanation of dairy wastewater through UASB at mesophilic temperature range", Engineering sciences, no.8, pp.1-9.

[23]. Onyimba IA and Nwaukwu IA " Generation of biogas from cow dung".

[24]. J. Lebrator, J.L.PérezRodríguezr, "Cheese factory wastewater treatment by anaerobic semicontinuous digestion" Resources, Conservation and Recycling, 3 (1990) 193-199, Elsevier Science Publishers B.V./Pergamon Press plc-Printed in The Netherlands, 193, Instituto de Ciencia de Materiales, C.S.I.C., Aptdo. 1052, 4,1080 Sevilla (Spain).

[25]. C. Maqueda and E. Morillo, "Cheese factory wastewater treatment by anaerobic semicontinuous digestion" Resources, Conservation and Recycling, 3 (1990) 193-199, Elsevier Science Publishers B.V./Pergamon Press plc-Printed in The Netherlands, 193, Instituto de Ciencia de Materiales, C.S.I.C., Aptdo. 1052, 4,1080 Sevilla (Spain).

[26]. Srinivasan G., R. Subramaniam and V. Nehru kumar (2009),"A Study on Dairy Wastewater Using Fixed-Film Fixed Bed Anaerobic Diphasic Digester" American-Eurasian Journal of Scientific Research 4 (2): 89-92.

[27]. T. Ramesh, V. Nehru kumar and G. Srinivasan (2012), "Kinetic Evaluation of Fixed Film Fixed Bed Anaerobic Reactor by Using Dairy Wastewater" International Journal of Pharmaceutical & Biological Archive; 3(4):835-837.

[28]. Deshannavar, UB, Basvaraj, RK and Naik, NM (2012), "High rate digestion of dairy industry effluent by upflow anaerobic fixed-bed reactor", Journal of chemical and Pharmaceutical Research, vol.4, no.6, pp.2895-2899.

[29]. Javed Iqbal Qazi, Muhammad Nadeem, ShaguftaS.Baig,(2011), "Anaerobic fixed film biotreatment of dairy wastewater", Middle-East Journal of Scientific Research 8(3): 590-593, 2011, ISSN 1990- 9233.

[30]. Shahjahan Baig and Quartulain Syed (2011), "Anaerobic fixed film biotreatment of dairy wastewater", Middle-East Journal of Scientific Research 8(3): 590-593, 2011, ISSN 1990- 9233.

[31]. Perera K.U.C., "Investigation of Operating Conditions for Optimum Biogas Production in Plug Flow Type Reactor" Master of Science Thesis, KTH School of Industrial Engineering and Management, Energy Technology EGI2009-2011 Division of xxx, SE-100 44 Stockholm.

[32]. Dioha I. J., C.H. Ikeme, T. Nafi'u, N. I. Soba and Yusuf M.B.S., September2013, "Effect of carbon to nitrogen ratio on biogas production", InternationalResearch Journal of Natural Sciences, Vol. 1 No. 3, pp.1 -10

[33]. Perera K.U.C., "Investigation of Operating Conditions for Optimum Biogas Production in Plug Flow Type Reactor" Master of Science Thesis, KTH School of Industrial Engineering and Management, Energy Technology EGI2009-2011 Division of xxx, SE-100 44 Stockholm.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, March 2022
Impact Factor: 6.252

[34]. Asha B., June 2014, "Influence of pH condition on the performance of fixed film fixed bed reactor in dairy wastewater" Direct Research Journal of Engineering and Information Technology (DRJEIT) Vol.2 (3), pp. 33-36.

[35]. Demirel.B and Yenigun.O (2004), "Anaerobic acidogenesis of dairy wastewater, the effects of variations in hydraulic retention time with no pH control".

[36]. Rajeshwari K.V., M. Balakrishnan, A. Kansal, Kusum Lata,V.V.N. Kishore(2000), "State-of-the-art of anaerobic digestion technology for industrial wastewater treatment", Renewable and Sustainable Energy Reviews, 4, 135±156,www.elsevier.com/locate/rse.

[37]. AbdelgadirAwad, Xiaoguang Chen, Jianshe Liu, XuehuiXie, Jian Zhang, Kai Zhang, HengWang, and Na Liu, "Characteristics, Process Parameters, and Inner Components of Anaerobic Bioreactors" Hindawi Publishing Corporation, BioMed Research International Volume 2014, Article ID 841573.

[38]. A. O. Adebayo, S. O. Jekayinfa and B. Linke, 2015 , "Effects of Organic Loading Rate on Biogas Yield in a Continuously Stirred Tank Reactor Experiment at Mesophilic Temperature" British Journal of Applied Science & Technology, 11(4): 1-9

[39]. Tabatabaei Meisam, Alawi Sulaiman, Ali M. Nikbakht, NorjanYusof and GhasemNajafpour (2011). "Influential Parameters on Biomethane Generation in Anaerobic Wastewater Treatment Plants, Alternative Fuel", pp. 227-263

[40]. T. Ramesh, V. Nehru kumar and G. Srinivasan (2012), "Kinetic Evaluation of Fixed Film Fixed Bed Anaerobic Reactor by Using Dairy Wastewater" International Journal of Pharmaceutical & Biological Archive; 3(4):835-837

[41]. Sivakumar M.S. and B. Asha, "Effect of organic loading rate on dairy wastewater using anaerobic bio-film reactor" Jr. of Industrial Pollution Control 28(1)(2012) pp 21-24, © EM International Printed in India.

[42]. S. Karthiyayini, A. Sivabharathy, C. Sreehari, M. Sreepoorani& V. Vinjth, "Production of Biogas From Dairy Waste Water", International Journal of Engineering Research and Modern Education, Special Issue, April, Page Number 131-134, 2017.

[43]. Bhadouria, BS and Sai, VS 2011, "Utilization and treatment of dairy effluent through biogas generation- a case study", International Journal of Environment Science, vol.1.

[44]. Despande D.P, Patil P.J and Anekar S.V (April 2012), "Biomethanation of dairy waste, Research Journal of Chemical Sciences, ISSN 2231-606X,vol.2(4),35-39.

[45]. [Jactone.A.O, Wen.Z, Ignosh.J, Bendfeldt.E and Collins, E.R (2009), "Biomethane Technology", Virginia cooperative extension publication, vol.3, pp.442-881.

[46]. Kolhe AS and Pawar, VP (2011), "Physico- chemical analysis of effluents from dairy industry", Recent research in science and technology, vol.3, no.5, pp 29-32.

[47]. Gavala.H.N, Kopsinis.H, Skiadas I.V, Stamatelaton.K, Liberatos.G, (1999), "Treatment of dairy wastewater using upflow anaerobic sludge blanket reactor", Journal of Agricultural Engineering Research, vol.73, no.1, pp.59-63.