



Waste Disposal Management in Indian Dairies: A Review of Literature

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Abstract:-

When milk products and all dairy processing wastes have been spilled, do not satisfy applicable quality requirements, have gotten contaminated, or have otherwise become unfit for human consumption, animal feed, or any other useful use, they must be properly disposed of. Farmers can recycle milk that can't be sold to a processor in the same way they recycle manure. Milk handling waste, for example, crude milk, handled milk, wash water, and sanitizers, is named modern interaction wastewater and may not be released to septic frameworks or to state waters through field tiles, direct unloading, or some other technique. In this paper there are sure surveys of writing to comprehend the removal of dairy squander in India.

KEYWORDS: Dairy Waste Management, Waste Disposal, Environment Protection, Dairy farming.

Introduction:-

Each product in the dairy industry generates waste of varying quality and quantity. The microorganisms present use them at a rate determined by environmental factors, resulting in pollution. The Indian government has promulgated the Environment Protection Act, 1986, which requires processors to pretreat effluents before discharging them into inland water or rivers. Raw milk is processed into products such as consumer milk, butter, cheese, yoghurt, condensed milk, ice cream, and indigenous dairy products in the dairy industry. Chilling, separation, and pasteurisation are among the processes used. For various products, waste is generated at each processing step.

Review of Literature:-

1. Proper Disposal of Dairy Waste and Cleanup Requirements, By Indian Department of Environment Management,(2022).

The Indiana Department of Environmental Management (IDEM) is giving guidance on the best way to appropriately discard dairy squander so the state's waters are not hurt. Dairy makers, transporters, samplers, cooperatives, depots, and handling organisations will profit from this reality sheet.

IDEM is responsible for spills and junk on the board, especially dairy squander. The Indiana State Board of Animal Health (BOAH), which controls the creation, transportation, handling, bundling, and circulation of dairy items for human utilisation, the Office of Indiana State Chemist (OISC), which directs creature feeds and compost use and applications, and the Indiana State Department of Health (ISDH), which manages business septic frameworks, worked together on the improvement of this paper.

2. “Green Up” Your Dairy Packaging, By Kathie Canning (2022).

Dairy processors would be advised to consider product packaging as a major component of their sustainability initiatives. Containers and packaging, according to the US Environmental Protection Agency, account for a significant component of municipal solid trash in the US, accounting for 82.2 million tonnes in 2018. (the latest year for which data are available). Waste isn't the only issue with packaging sustainability. Packaging, for example, frequently uses nonrenewable source materials and nonrenewable energy.

3. Research Paper on “Waste Management Issues For Dairy Processors”, By Tommy G. Thompson, Department of Natural Resource, Wisconsin (2022).

The milk was frequently redirected to other dairies by the farmer patron who supplied it. Small cheese makers have begun producing specialty cheese for a niche market as of late. Cheese manufacturing and whey processing are the two main types of dairies that the DNR supervises. There are a few dairies that churn butter, bottle milk, and make ice cream and other dairy products like yoghurt, but these dairies, with the exception of two butter producers, tend to send their wastewater to publicly owned treatment plants.

4. How to Treat Wastes from Dairy Industries? Waste Management, By Nimmi G. (2022).

One of the most notable advances in the food processing business during this time is the rapid rise of the dairy industry. Dairy and food engineering are important subjects in the food science curriculum, and this trend is likely to continue.

5. How A Dairy Farm Is Using A Straw Dryer To Reduce Waste, By Judith Tooth (2022).

The rancher Jonny Wyatt is utilising waste intensity from the anaerobic digester plant on his blended homestead close to Thetford, Norfolk, to dry out - of - spec straw to make dryer sheet material for his domesticated animals.

6. Book on “Waste Management (Challenges and Opportunities in India)” By Varsha Bhagat Ganguly (2022).

In this book, The cycles and activities expected to oversee garbage from its commencement to conclusive removal are remembered for squandering the executives. This covers squander assortment, transportation, treatment, and removal.

7. Book “Farmers Guide to Profitable Dairy Farming” , By Parvaiz Ahmed Reshi (2021).

This book is useful to educate the unemployed workforce in the country, dairy farming appears to be a safe and easy business to attain livelihood.

8. Article on India’s Solution to Cut Milk Waste, By DairyGlobal (2021).

According to this article, milk should be chilled at the source in order to extend its shelf life and reduce waste. Milk producers must rely on diesel generators to provide refrigeration, which makes the chilling process costly.

9. Climate Crisis: Way Forward for Dairy Giants in India, By Sanhana Gorti, Ahaana Mahanti, DVR Seshadri (2021).

This article described that India has gone from being a milk-deficient country to the world's greatest milk producer. The Anand model (Amul), which has since been reproduced across the country, has increased milk output and made dairy India's second-largest employer after agriculture.

The business has reignited the debate over the negative effects of animal harvesting on the environment, with the non-profit People for the Ethical Treatment of Animals leading the campaign.

10. What does the Future hold for Dairy Farming? By Debbie James (2021).

The objective of the paper is to further develop the homestead business' ecological maintainability by decreasing waste and utilising the "squander" created while bringing down substantial cell counts. The subsequent farmstead fertiliser is then taken care of to the AD plant, which creates energy for the ranch and digestate, which is utilised to prepare the grass for the dairy head.

11. Book “Dairy Industry In India Since Independence” By Dr. S.B.Nageswararao (2021).

In this Book, Water quality has been archived to be affected by unpermitted releases and additionally inadvertent spills of milk and dairy items into a stream, bringing about fish fatalities. Whenever milk is unloaded into a stream or lake, it supplies nourishment for microbes that live and create on oxygen in the water. Fish and other sea-going species living in the affected stream are often anxious or killed because of bacterial advancement following a major delivery or spill.

12. Book “Dairy Plant Engineering and Management” By Tufail Ahmad, (2021).

This is a reading material on dairy plants the executives and dairy squander the board that is utilised in the dairy innovation and waste administration courses. Request of dairy items is expanding in various nations, which brings about the improvement of the dairy business and expansions in the age of squanders. The fundamental squanders created are whey, dairy slops and wastewater (handling, cleaning and sterile). They have high supplement fixation, natural

oxygen interest (BOD), substance oxygen interest (COD) and natural and inorganic items.

Besides, they can contain different disinfecting specialists and a wide scope of corrosive and basic cleansers. Contamination because of the dairy business influences the air, soil and water quality.

13. Guidelines for Environmental Management of Dairy Farms and Gaushalas, By Central Pollution Control Board, Delhi (2020).

Guidelines for the management of dairy waste were mentioned in this study. These guidelines apply to businesses that discharge waste into the environment. This establishment must also adhere to all applicable laws, rules, guidelines, instructions, and standard operating procedures given by various organisations.

14. Packaging in the Dairy Industry, By FactSheet.com (2020).

Milk and dairy items are bundled in an assortment of materials in view of an assortment of boundaries including item type, handling and stockpiling conditions, dealing with needs, and extreme use. Glass and additionally plastic jugs, covers (multi-facet materials), pockets, plastic tubs, jars, and different compartments are the most generally utilised holders. They all share one thing practically speaking: they are constrained by regulation to give all item data.

15. Dairy Waste is Being Turned into Bioplastics and Plant Food, By Sarah Wild, (2020).

Dairies are important economic drivers in rural communities across Europe, but they generate a lot of trash from cleaning and processing. Normally discarded wastewater and milk leftovers are increasingly being transformed into new goods such as phosphate-rich fertiliser and bioplastics.

16. Organic Waste Production and Utilisation by Dairy Farmers in District Ludhiana of Punjab, India, By Amandeep Singh (2020).

According to this research paper, India's share of organic waste will increase from 40% to 60% between 2000 and 2022. With such a large potential for waste generation in rural areas, there is a strong need to understand the socio-personal profile of farmers living in rural settings, as well as how socio-economic profile affects organic waste production and utilisation, so that various interventions can be designed and implemented based on socio-personal variables for effective waste utilisation.

17. Research Paper on Dairy Waste Management (Waste to Gold : Source Waste Management), By Anuradha and B.M. Sharma (2019).

According to this research paper, dairy squander is a particular kind of waste since it is biodegradable and has critical customary significance as a blessed asset equipped for restoring an assortment of illnesses, including disease. In any case, in the present advanced world, with no opportunity to oversee undesirable assets and rivalry in the field of efficiency, this asset remains unutilized and is oftentimes depleted to dispose of by dairy ranchers, bringing about unfortunate scenes, scent contamination, and accordingly open irritation. Besides, release into waterways can cause contamination and eutrophication.

18. Article on “Disposing of Milk”, By Department of Primary Industries and Regional Development, Government of Western Australia (2018).

According to this Article, Unless milk can be carried to a suitable dumping place, it should be disposed of on the farm. It should not be permitted to enter the surface or groundwater,

and it should be properly disposed of. It will stink if it is left in the pond. The ideal choice is to spread over pasture or cultivated land.

19. Advanced Methods of Dairy Farm Waste Disposal, By Amit Kumar Singh, Surjyakanta Roy, Tripti Kumari (2018).

There have been a lot of conversations about trash management recently. In the case of livestock farms, there should always be a sophisticated and cost-effective waste disposal technique. Advanced techniques for various agricultural operations are being developed on a daily basis. Manure and farm waste disposal can be done in a variety of ways that are both cost-effective and efficient. Inattention to effective waste management will result in significant pollution as well as nutrient loss. A better understanding of these strategies will undoubtedly improve farm operations' efficiency, and there may be opportunities to profit from what has been labelled as waste.

20. Article on “General Characteristics and Treatment Possibilities of Dairy Wastewater, By Aleksandar Kolev Slavov (2017).

The milk processing sector is one of the world's most important businesses, the treatment options for dairy effluents have gotten a lot of attention. The goal of this paper is to examine recent dairy wastewater research. Real dairy wastewater is characterised in terms of its origins, types, liquid by-products, and general indicators. The various approaches for managing dairy effluent are summarised. The focus is on in-factory treatment methods, with biological processes taking centre stage. The merits and cons of aerobic and anaerobic approaches are thoroughly examined.

21. Impact of Dairy Effluent on Environment - A Review, By B.V. Raghumath, G.**Rajarajan and A. Irshad (2017)**

Over the last 45 years, India's dairy industry has evolved from a nearly unorganised to a vastly complex organised industry of enormous scale. With an annual growth rate of 4-5 percent, India's milk production is expected to reach 155.2 million tonnes in 2016-17, up from 84.5 million tonnes in 2002. In terms of milk production, India has long been the world leader.

22. Study on Characterisation of Indian Dairy WasteWater, By Rakesh Mehrotra,**A.Trivedi and S.K.Mazumdar (2016).**

According to this study, the growing awareness of nutrition and health, as well as organised efforts to improve milk production, have resulted in large-scale milk production, processing, and distribution through a large number of dairies.

23. Biotechnological Alternatives for the Utilisation of Dairy Industry Waste Product,**By Ashutosh Sharma (2015).**

This paper demonstrates how cattle dung and urine, when managed scientifically, can be used as biofertilizers/biopesticides and other available technologies. The paper also emphasises that in order to prevent pollution, this resource must be used in a scientific and environmentally friendly manner.

24. The Dairy WasteWater - A Case Study, By Swati A. Patil, Vaishali V. Ahire and**M.H. Hussain (2014).**

This dissertation contains Dairy wastewater treatment that requires immediate attention due to its highly biodegradable nature, but it is not a major issue. Dairy wastewater can be easily treated using biological treatment technologies. The final effluent can be used for irrigation,

and the sludge itself can be used as fertiliser. If waste is dumped in bodies of water or on the ground, BOD becomes a major concern. Boiling water is a compelling method for eliminating remaining butterfat from cream handling, margarine making hardware and ghee making gear however the water temperature should not be excessively high ($< 65^{\circ}\text{C}$). In like manner, set up a waste administration plan. To start the course of cleaner creation, an adjustment of culture to squander minimization is required. This includes moving from contamination treatment and control to expectation and counteraction of squanders.

25. Research Paper on Dairy Waste Management, By Devang Jani (2009).

Every process in this paper generates some undesirable by-products with products. India is the world's largest producer of milk. About 2-3 lit of waste is used for every lit of milk processed, resulting in biodegradable effluent with a high BOD value. Global environmental concern has sparked a worldwide awakening to the importance of environmental protection, and industrial waste disposal standards are becoming more stringent.

26. Book on “Commercial Dairy Farming (to produce milk with project profiles), By Engineers Indian Research Institute (2009).

The book milk is processed into products such as consumer milk, butter, cheese, yoghurt, condensed milk, ice cream, and indigenous dairy products in the dairy industry. Chilling, separation, and pasteurisation are among the processes used. For various products, waste is generated at each processing step.

27. HandBook of Dairy Farming (to produce milk with packaging), By Engineers India Research Institute (2008).

In This Book Various Aspects Are Mentioning Like, Cattles Dairy Farming Ration Dairy Animals' Housing Care For Dry Cows In Livestock Management Livestock Data Maintenance Manufacturing Methodology Production Of Pure Milk Animal Diseases Dairy Cattle Economics Storage Of Milk Milk Distributors, Suppliers Of Equipment, Seeds, Drugs, And So On Dairy Farm Economics Of Milk Packaging (Buffalo) Dairy Farm Plant Economics For Milk Production (Cow) Plant And Equipment Suppliers Packaging Material Suppliers.

28. Waste Management in Dairy Industry - Current Practices, By Ranjeeta Wadhvani, L.K. Murdia, Sunil Paliwal (2005).

The various waste handling and treatment systems employed in India's dairy industry are discussed. Whey fermentation for ethanol, single-cell protein, galactosidase, baker's yeast, lactic acid, ammonium lactate, propionic acid, and methane, as well as waste water treatment and biomass engineering, are all discussed. This study also discusses the management of air and noise pollution.

29. Book “Outlines of Dairy Technology” By Sukumar De (2001).

This book seeks to familiarise dairy farmers with the most important and relevant principles of dairy management, ensuring that they are well-versed in the fundamental concepts, practises, and techniques that create the present process of the science.

30. Managing Dairy Wastes, By Robert G. Yeck, US Department of Agriculture, (1981).

Waste from milk houses and milk rooms will continue to be a problem. They'll presumably be diluted and disposed of with dairy dung for the most part. However, public pressure is likely to prevent the same treatment of toilet waste as dairy manure.

Conclusion:-

Dairy wastes are a mixture of faeces, urine, bedding, and unconsumed feed that most dairymen refer to as manure. Dairy waste is a broader phrase that encompasses waste from milking parlours. Milk house squanders are for the most part water joined with somewhat cleanser and milk, however they might contain human faecal matter on the off chance that the milk house has a latrine. A young fellow experiencing childhood with a dairy homestead's most un-most loved obligation was presumably cleaning the animal dwelling place. Just when contrasted with the option of managing disgusting cows in a foul climate might this movement at some point be viewed as appealing. When business composts were not ordinarily accessible, dairymen searched for ways of working on the efficiency of their homestead, permitting them to have more cows and subsequently more cash. All the food taking care of plants, including multi-thing modern offices, produce wastes in a single construction or the other. The food contains a great deal of starches, proteins, fats and mineral salts. During flushing and washing movement of various communication equipment, these enhancements enter the drainage and favour the improvement of anaerobic and oxygen consuming infinitesimal organic entities. Along these lines the flushed water releases unpalatable smell and can transform into an evacuation issue as such in the region's sewerage. This consolidates the deliberate arrival of unfortunate materials, for instance, whey, spent cleaners and debilitated things not made sure to be worth recovering. Liquid milk creation could provoke the period of fragrance, wastewater, disturbance and solid waste. Best practice incorporates taking care of the extraordinary incidental effects like whey, buttermilk and skim milk, into

high worth things like skim milk powder (SMP), buttermilk powder (BMP), whey powder, whey protein concentrate and casein, rather than being used as low worth animal feed/fertiliser or being dumped as waste. Cream and margarine are thick and oily and stick to equipment surfaces significantly more unequivocally than liquid milk, extending the issue of dispensing with stores.

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