

# Effect of Neem (*Azadirachta Indica*) As Natural Absorbent on the Ph of Dairy Waste Water

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**Abstract -** The consumption of large volumes of water and the generation of organic compounds as liquid effluents are major environmental problems in milk processing industry. A large number of chemicals are used for the production of potable water and in the treatment of wastewater effluents. Dairy industries have shown tremendous growth in size and number in most countries of the world. The adsorption process is one of the effective techniques and various natural adsorbents are widely used for removal of emerging pollutants in dairy wastewater. The use of natural adsorbents has been widely investigated as a replacement for current costly methods of removing pollutants from dairy effluent. The aim of this study is to contribute in the search for less expensive adsorbents and their utilization possibilities of various agricultural waste by-products such as sugarcane bagasse, rice husk, oil palm shell, coconut shell, coconut husk for the elimination of pollutants from wastewater.

Present study deals with the effect of natural absorbent i.e. Neem on the pH of the waste water comes from the dairy industry.

**Key words-** Pollutants, effluents, absorbent, potable water and waste water.

## INTRODUCTION:-

The dairy industry is one of the important food industry among all and major source of waste water [1]. Waste water is generated in milk processing unit, mostly in pasteurization, homogenization of fluid milk and the production of dairy products such as butter, cheese, milk powder. Large amount of water is used to clean dairy processing plants; hence, the resulting waste water can contain detergent, sanitizers, base, salts and organic matter, depending upon source. In land received waste water affect the soil quality and soil structure and part of waste water can also leach is to underlying groundwater and affect its quality [2]. The problem is more serious, when it concerns waste water discharge before treatment from dairy or milk processing industry.

The annual cost of treatment and disposal for the typical plant appears to be in the order of a million dollars as a whole is many millions of dollars. Disposal of untreated water is rapidly becoming a major economic and societal problem faced by the dairy processing industry in many respects [3]. Almost all the dairy factories are facing the problem of water treatment, disposal and

utilization of the waste water. Disposal of waste water into rivers, land, fields and other aquatic bodies, without or with partial treatment, in crude tanks, will soon offer a serious problem to health and hygiene [4,5]. In this regards it is very necessary to treat the dairy waste water to protect the environment and ecology. But due high cost of chemical and equipment and typical design, the industries are not willing/interest to treat the waste water.

Dairy plants waste water cannot immediately be drained into lakes, rivers or other sources for post-usage. Since effluent waste water from dairy factories contain high amounts of nutrients, organic matter, sugar, proteins, fats and possibly residues of additives[6].

Production is inversely proportional to environment let's have a look on the effect of the dairy industry on the environment[7]. The dairy industry wastewaters are primarily generated from the cleaning and washing operations in the milk processing plants. It is estimated that about 2% of the total milk processed is wasted into drains [8]. Wastewater is the serious problem in the dairy plant operation since a large quantity of water is used for product addition and utensil cleaning. Small scale dairy plant discharge their wastewater directly to nearby areas such as idle land and/or natural receiving water body[9]. The discharge volume depends on the size of the plant.

High concentration of organic matter in dairy wastewater causes pollution problems to surroundings. But they also have the potential to supply carbon in a form that anaerobic microorganisms can convert into methane. Dairy wastewater is an important source of inland water pollution when released into local rivers or lakes without treatment. With increased dairy industries in the region, the disposal of the processing waste is becoming a major problem that must be appropriately addressed. Thus, the challenge of balancing the dairy wastewater into a more environmental friendly waste requires a sound and efficient treatment and disposal approach. It must be treated and cleaned before it released into the environment.

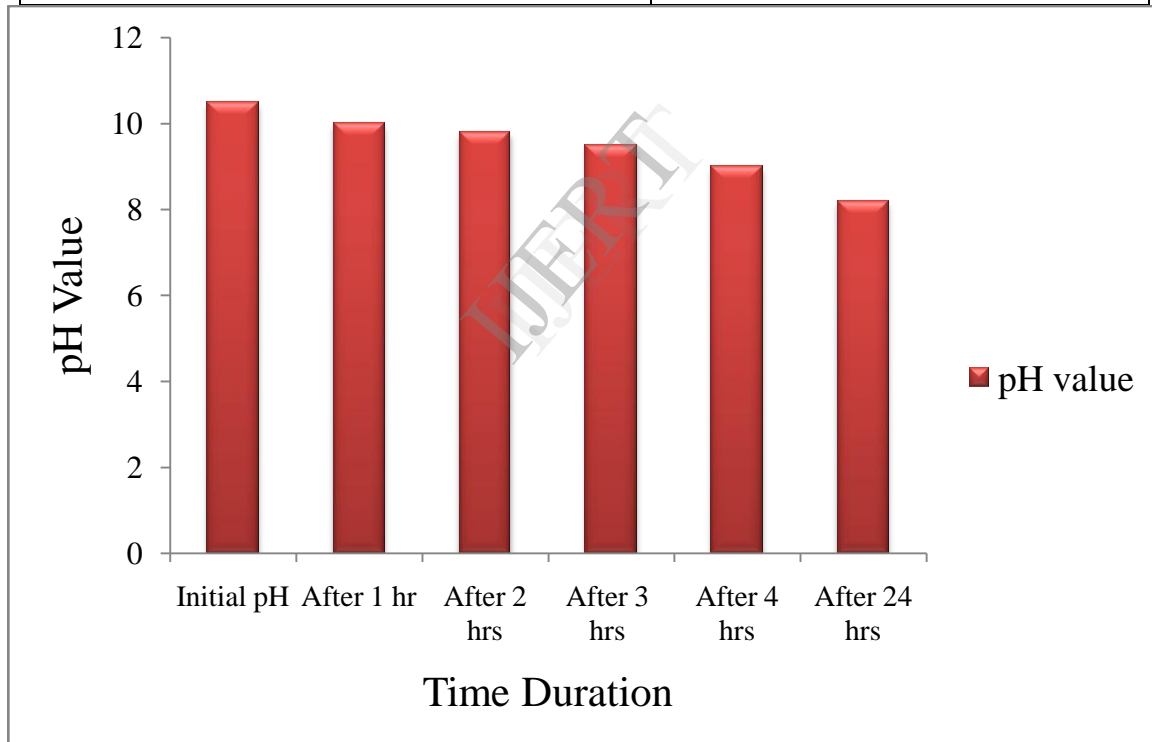
**Materials and Method-** The Dairy Wastewater sample that was collected from Sachi Dairy, Ujjain, Madhya Pradesh, India was the mixed effluent from the different

activities regarding the washing of equipment and making of products. The characteristic of the Dairy wastewater above was considered the mixtures of the effluent from utensil cleaning plus other acuity related to the production site. From the range of the data obtained the Sachi-Dairy wastewater samples had slightly different compared to the reported typical quality of Dairy wastewater. This wastewater had low

strength than the typical. The collected sample was treated with natural absorbent i.e. Neem (*Azadirachta indica*). Initially absorbent was prepared by the crushing dry branches of the tree and then 10grams of absorbent was mixed with 100ml of effluent and random shaking was done. And after every 1 hr continuous pH values were recorded.

**Result and Discussion:-** The recorded results were:

Time Duration	pH value
Initial pH	10.5
After 1 hr	10
After 2 hrs	9.8
After 3 hrs	9.5
After 4 hrs	9.0
After 24 hrs	8.2



**pH-** At initial level the pH of effluent was reported as 10.5, which indicated the water is highly alkaline. After 1 hr the pH reduced to 10, after 2 hrs it became 9.8, after 3 hrs it was 9.5, after 4 hrs the pH recorded was 9.0 and after 24hrs the pH value was 8.2. Which shows the water is quite lesser alkaline than initial level. When the pH value falls below 6.15 or rises above 8.5, many of the basic nutrients become died up, so that they are unavailable to plants and the overall productivity is lowered. pH was found to be alkaline in nature. pH is affected not only by the reaction of carbon dioxide but also by organic and inorganic solutes present in water. Any alteration in water pH is accompanied by the

changes in other physico-chemical parameter. pH maintenance is one of the most important attributes of any aquatic system since all the biochemical activities depend on the pH of the surrounding water.

**Conclusion:-** In present work attempt have been made for systematic studies of reduction of the pH using low cost adsorbent prepared from dry Neem braches. From the experimental finding it has been observed that the adsorbent material can be used successfully for reduce the pH. The experiment is aimed to utilize the commonly available waste material Neem braches[10]. Various amount of the sample was taken and the adsorption study was carried out. Thus from the studies

carried out it can be concluded that the prepared crushed Neem braches can be used effectively to reduce alkalinity of the waste water. There is a tremendous potential in these materials to be explored as industrial low cost effective adsorbent[11].

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