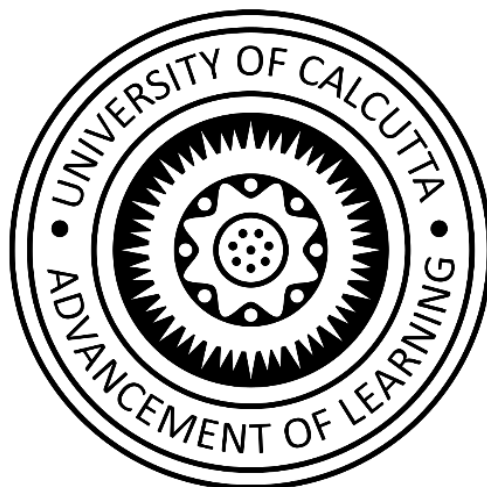


UNIVERSITY OF CALCUTTA



**B.SC HONOURS
MCB-A-CC-5-12-P
SEMESTER – 5
Session-2022-23**

**CC-12 INDUSTRIAL MICROBIOLOGY
(PRACTICAL)**

REPORT ON INDUSTRIAL VISIT



INDUSTRIAL TOUR
TO
MOTHER DAIRY NOW KNOWN AS
BENGAL DAIRY

BY
DEPARTMENT OF MICROBIOLOGY
ST. PAUL'S CATHEDRAL MISSION COLLEGE
UNDER
UNIVERSITY OF CALCUTTA

ACKNOWLEDGEMENT

This project is done as a semester project as a part of a course titled Industrial Microbiology under CC-12.

I would like to thank Mr. Abhishek Das for taking us there in the industry and giving us this opportunity to explore into real-world realizing the product processing of the Dairy industry, without which a society can never progress.

I am also greatly indebted to all of the members of Bengal Dairy (Mother Dairy) without whose support our intention of the visit could not have been made possible.

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ABOUT THE INDUSTRY

NAME OF THE COMPANY

Mother Dairy Kolkata now known as Bengal Dairy

[An ISO 9001:2000 & HACCP certified Company]

LOCATION

Mother Dairy Calcutta

P.O Dankuni Coal Complex, District Hooghly

West Bengal Pin:712 310

Post Box No. 204, G.P.O. Kolkata -700 001

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JOURNEY

On the 7th of January 2023 our entire team consisting of 5th-semester B.Sc. Hons. students of St. Paul's Cathedral Mission College, Department of Microbiology, Kolkata visited Bengal Dairy for our Academic Industrial Tour. We were taken on a tour of the various units of the plant.

Their industry uses cutting-edge technology and has supplied most of the milk and milk products in different areas. They are having an ISO 9001:2000 & HACCP Certificate for their excellence.

INTRODUCTION

Bengal Dairy Calcutta -a Government of West Bengal project, was started under Operation Flood II of the National Dairy Development Board. It was set up initially to cater to the demand of the Kolkata urban agglomeration spread over the Kolkata Metropolitan area, approximately 852 sq. km. Mother Dairy is also reaching out to the consumers of other Districts. The commissioning of the Dairy started in July 1978 and the first Distribution vehicle loaded with milk sachets rolled out of the Dairy in the morning of 8th December 1978. Initially, the management of Mother Dairy was looked after by the National Dairy Development Board.

On 24th March 1982, the then Honourable Chief Minister Shri Jyoti Basu dedicated Mother Dairy Calcutta to the rural milk producers and urban milk consumers of West Bengal. From then onwards, the story of Mother Dairy is one of success after success. The growth of Dairy continued unabated. Mother Dairy safeguards the interest of the rural milk producers by encouraging cooperative movement & marketing the surplus milk available from the villages, thus helping the milk producers to realize their own potential for organized endeavor & the creation of more rural wealth in the shape of 'Anand Pattern' as more profound by Dr.V.Kurian, The Milk Man of INDIA.

In November 1996, the management of Mother Dairy was taken over by West Bengal Cooperative Milk Producers' Federation Ltd. It is selling Milk & Milk Products like Mishti Doi Flavoured Yoghurt, Plain yogurt Paneer, Cow Ghee, and Packaged Drinking Water. Now it has started diversifying its activity by selling the produce of other Cooperative, Unions of West Bengal and other States as Mother Dairy has a strong marketing network.

Under Operation Flood III in the year 1997, the processing capacity of the plant was increased from 400,000 L per day to 600,000 L per day.

MISSION:

Mother Dairy is committed to enhance the Milk Procurement through Technical inputs by providing Quality services to their Member Producers by ensuring economic viability to improve socioeconomic conditions of their Members. Mother Dairy is also committed to supply quality milk and milk products to consumers. Their Dairy shall become top dairy in the country with its inspired team of employees. They, the inspired Team of Employees are dedicated to Co-operation, Honesty, Discipline & Time, Quality & Purity, Hard Working, Transparency and Trust & Belief on Organization, Mutual Respect, and Skill Development & Education. Their main object is to serve the farmers and to give help to their economic development, and provide Quality Milk & Milk Products to the Consumers.

QUALITY POLICY:

Mother Dairy endeavors to be one of the largest processors of milk and manufacturers of milk products in India. They are committed to providing, safe and nutritious products while meeting the statutory and legal requirements to achieve customer satisfaction and in-turn to improve the economy of our member producers. To this effect, the management is committed to communicate, implement, maintain and continually improve the Quality and Food Safety Management Systems in the Dairy.

COLLECTION OF RAW MILK

Mother dairy is a cooperative dairy located in Dankuni, West Bengal where raw milk is collected from farmers and distributed to plant placed in Dankuni.

A huge amount of milk is collected in daily basis and they are processed further. They have complete transport system regarding the collection of milk in time. There are large storage silos in which the milk is stored for further processing.

PROCESSING & PRODUCTION OF DIFFERENT MILK PRODUCTS

In UNIT II the collected milk is transferred to large homogenizer where the milk was separated in cream and skimmed milk. In this unit different milk by products were prepared in different sub-units.

Test of raw milk:

Raw milk is subjected to various tests for checking the quality of the milk and processed accordingly.

- 1. Microbiological assay**
- 2. Chemical assay**

Microbiological assay:

- Coliform Test:** If 5 coliforms are present in the milk then the milk is contaminated. if more than 5 coliforms are present then the milk is transferred 4 making ghee.
- Methylene Blue Reductase Test (MBRT):** This test is done to grade the quality of raw milk. (Common organisms – *S.aureus*, *E.coli*, *Salmonella*, *Shigella*, *Lysteria*, etc.).
- Yeast-mold counts:** This is done for curd, lassi etc
- Most probable number test:** Water treatment done to check for any contamination by MPN test. Water is purified by UV sterilization. If water is contaminated, milk and milk products may also get contaminated as water is required in every step of processing, cleaning equipment, etc.

Chemical assay:

- Butyrometer:** It is an instrument used to determine the fat content of the milk and milk products. The milk sample is mixed thoroughly and 10ml of 90% sulphuric acid was added to the butyrometer. Then, 10.75ml of milk was slowly added to it. Then 1ml alcohol is added, followed by centrifugation for 3-5 mins. The fat percentage is read directly in the graduated butyrometer.
- Heat stability test:** It is used to check protein stability. 0.5ml of 0.1N HCl + 10 ml milk. The mixture was put in a water bath. If the milk appears clear, then it is of good quality. If clots appear, then it is not good.

- **Acidity test:** This test is done to detect the pH of the milk.

- **Pasteurization Unit:** Includes pasteurizer, homogenizer, separator, etc. 20000 litre milk is pasteurized for 1 hr in big pasteurizer and 10000 litres in small ones. Cream is separated out by centrifugation and pumped out through upper outlet by separator. Homogenizer homogenize the content of milk.

After performing the tests milk is subjected to various other processing. Good quality milk is packaged and those whose qualities are not so good are subjected to the formation of by-products accordingly.

Lists of different by-products are as follows:

- Double Toned Milk
- Cow Milk
- Toned Milk
- Full Cream Milk
- Mishti Doi
- Plain Yoghurt
- Flavoured Yoghurt
- Paneer
- Cow Ghee
- Packaged Drinking Water
- Rosogolla & Rajbhog

QUALITY CONTROL

Mother Dairy endeavors to be one of the largest processors of milk and manufacturers of milk products in India. They are committed to providing hygienic, safe and nutritious products to customers. To this effect the management is committed to keep the quality of milk and its product high. All necessary quality testing of milk was done aseptically in quality controlling unit where they follow the Indian standard methods.

ENVIRONMENT POLICY:

- This company is reactive and conscious of various Environmental Regulations.
- Mother Dairy creates and maintains a Clean Green Belt in and around the Dairy premises.
- Company always keeps Environment Safe and Free from the population's continual sustainable development. & maintain a harmonious relationship amongst employees and with the public at large

PACKAGING

All packaging units of individual by-products were held in the production unit. All milk products were packaged simultaneously in a different size in the production unit. The preservation unit was running along with the packaging unit where all products were kept at their optimum storage temperature and finally supplied to shops.

PRODUCTS

- **Standardized milk (Supreme Milk)**
Fat 4.5% min
SNF (Solid not fat) 8.5%
- **Cow milk (Pransuddha)**
Fat 3.2% min
SNF 8.3% min
- **Double-toned milk (Swasthasathi)**
Fat 1.5% min
SNF 9% min
- **Toned milk (Ayush)**
Fat 3%
SNF 8.5%
- **Mishti Doi**
Fat 3-4%
SNF 31-34.5%
Sugar 18%
- **Probiotic Doi**
Fat 3-3.5%
SNF 10.5-16%
- **Curd**
Fat 3-5%
SNF 11-16%
- **Mango yogurt**
Fat 3.5%
SNF 23.5%,
Sugar 14%

ACHIEVEMENTS

{Mother Dairy Calcutta is Rich in Heritage and Tradition}

- Mother Dairy Calcutta first introduced Poly Pouch Milk in Eastern [Especially at Kolkata] in 1978.
- Mother Dairy Calcutta introduced loose milk selling through automatic coin-operated Booths first in Eastern India [Especially at Kolkata] in 1980.
- Mother Dairy Calcutta first introduced Highly perishable cultured milk product like Mishti Doi and Yoghurts through pilferproof cup under sealed condition having 6 days self-life under normal refrigeration breaking the tradition of selling this product through earthen pot.
- Mother Dairy Calcutta has first introduced the cultured milk products in Eastern India in most of the domestic and international flights operating from Kolkata. \
- Mother Dairy first introduced cultured milk products in Eastern India in most of the trains, especially in Rajdhani Express, Coromondal Express, Bombay Mail 1 operating from Howrah and Sealdah.
- Mother Dairy Calcutta has first received the National Productivity Award in the Eastern India Dairy Industries.
- Mother Dairy Calcutta has first accredited the ISO 9001 : 2000 certification in the Eastern India Dairy Industry.
- Mother Dairy Calcutta has first achieved the HACCP certificate in the Eastern Dairy Industry.
- Mother Dairy Calcutta has first received the Environment Excellence award [2000 - 2001] in the Eastern India Dairy Industry.

CONCLUSION

During this industrial visit, we gathered knowledge regarding the various processes of milk processing and also other milk products. This knowledge will help us in the future regarding our career opportunities. This educational industrial visit was a one-time experience provided by our department to help us get a taste of what might be our future career prospects in this field.