

DEPARTMENT OF MICROBIOLOGY

INDUSTRIAL VISIT TO MEGHALAYA MILK PROCESSING CENTRE

An Industrial visit was organized for the students of the Department of Microbiology, Shillong College to Meghalaya Milk Processing Centre located at Mawiong on the 28th May 2022. The visit was organized to make students familiar with various processes of milk processing and to understand the importance of refrigeration and air conditioning.



About The Milk Union

The East Khasi Hills District Cooperative Milk Union Ltd., Shillong was established on the 15th September 2009 and registered as SHILL/25 of 2009 dated 15th September 2009 under Section II of the Meghalaya Cooperative Societies Act (Assam Act I of 1950 as adapted by Meghalaya) with its area of operation within East Khasi Hills District. All milk procurement and marketing in the district is being made through the Union. It started functioning as a business module on 1st September 2017.

The formation of the Union was form based on the Anand Model (AMUL Model) with the Dairy Cooperative Societies being the primary village level organisation comprising of Dairy Farmers who federated to form a District Milk Union. The main role of the Union is to look into the welfare of the Dairy Farmers by making Dairying a sustainable source of income. The Union take the role of procuring the excess milk produced by the Dairy Farmers which otherwise would have gone wasted, process and market the milk and milk products thereby preventing the Dairy farmers from being exploited by the middlemen.

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Processing Of Milk In The Factory

We arrived at the Milk Processing Centre at 10:00 AM. Plant visit was conducted by Shri Mewanhi Ksoo, Assistant Manager (Training) and Shri Fairly First Pathaw, Assistant Manager (Marketing). Students interacted with them during the visit and came to know about the processing stage of milk after collection from the local farmers/ milk parlours. The plant



is fully automated and dedicated to produce milk through pasteurization process. Besides Milk Package, Dahi, Paneer and Ghee are some of the milk products produced by the centre. A brief introduction of White Revolution Movement led by our former Prime Minister Shri Lal Bahadur Shastri to provide an uplifting growth that led to a transparent system in the milk production in our country. He also demonstrated about the milk processing stages:

1. Clarification, in which milk is spin at a very speed, removing all dust particles that are invisible to the naked eye.
2. Standardization which helps to maintain uniformity by raising or lowering its fat and solid not fat percentage to a desired levels, so as to deliver milk to consumers as per prescribed norms.
3. Homogenization which improves palatability of milk and finally
4. Pasteurization, which kills all pathogenic bacteria present in the milk and thus making it safe for consumption.

We were told that the fresh milk is sourced from the farmers and state level cooperatives to their centre, where they are checked for all parameters of basic quality and further they go for specification and chilling process. Milk is then supplied to the Dairy units through insulated milk Tankers under chilled condition in order to maintain the freshness. Then further it goes for strict quality check and adulteration. The executive showed the practical test in their lab to the students to check the purity of milk. In the processing units hygiene is given utmost importance. Further the students were shown the manufacturing unit the vaults where all the processing takes place.

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Learning From The Visit:

1. Our Students learnt about the sequence of operations in the production of milk and allied products.
2. Students learnt about the processing, quality measures to check and maintain the quality of the product, and the maintenance requirement in the plant.
3. Students were also made aware of the challenges in terms of achieving daily targets and resource management etc.



Conclusion:

The visit ends with group photographs along with the students with a positive note that such visits helps to enlarge the sight of the students. They not only became aware with the process of the industry but can also assess the possible problem and may be able to come up with new and innovative ideas.

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FREE COVID-19 VACCINATION SESSION

organised by

DEPARTMENT OF MICROBIOLOGY, SHILLONG COLLEGE

In Collaboration With

OFFICE OF THE ADDL. DISTRICT MEDICAL & HEALTH OFFICER



From Left to right: Staff of the Office of the district Medical & Health Officer, East Khasi Hills District, The Principal, Vice-Principal, IQAC Coordinator and Faculties of Microbiology Department

A free vaccination drive was successfully organized by Microbiology Department in collaboration with the Office of the District Medical & Health Officer, East Khasi Hills District, every Wednesday and Thursday from the **24th of November 2021** at Shillong college. More than 50 Students and staff of the college received the vaccination.

The six-day programme was started in the presence of dignitaries like Prof. E. Kharkongor, (Principal, Shillong College); Prof. B. Syiem (Vice-Principal Professional course, Shillong college); Prof. S. Sarma (IQAC Co-ordinator); staff & faculties of Microbiology Department Shillong College and Staff of District Medical & Health Officer, East Khasi Hills District.

This vaccination camp was organized for students and staff aged 18 years and above. 53 people were vaccinated with Covishield vaccine under this drive. During this, all protective measures related to Covid-19 were adopted by Staff Nurse and Faculties of Microbiology

Department played an important role in making this vaccination drive a success. In the end, the Head of Microbiology department, Shri Zoliansanga, congratulated the entire team for the successful organization of the camp and he also hoped to conduct such activities in future as well.

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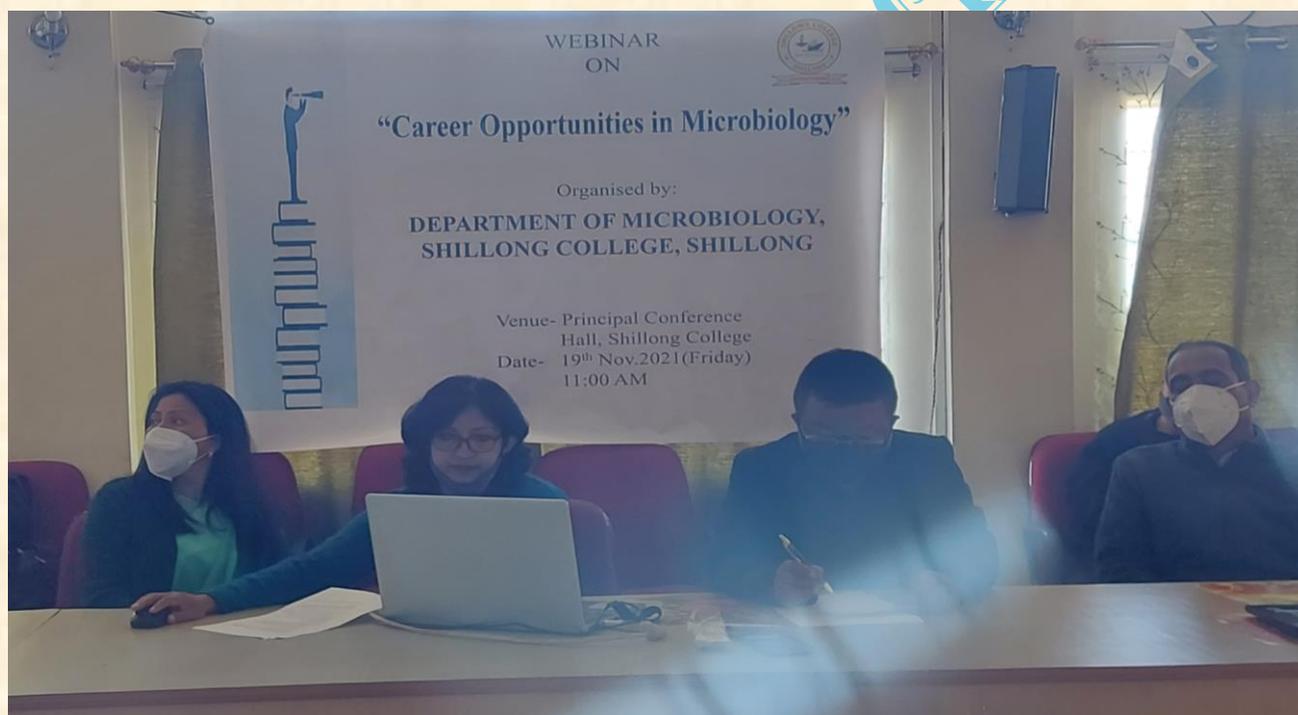
Webinar On

“CAREER OPPORTUNITIES IN MICROBIOLOGY”

Organized By

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The current pandemic caused by the SARS-CoV-2 virus has revealed the deadly roles played by microorganisms, but these unseen organisms can be tamed only with the inputs of a microbiology student. Apart from causing diseases, microbes have crucial roles in food production, environmental science, medicine, and basic research. In times of constant information overload, reliable information is becoming more valuable than ever.



Department of Microbiology, Shillong College, organized a webinar on ‘Career opportunities in Microbiology for students of the department and students of Class XI & XII (Science stream) of the college using blended mode i.e online and offline mode on November 19, 2021 from 11: 00 am to 12:30 pm. The webinar was attended by 167 participants. The resource person was Smt D.N. Srividya, a Senior scientist at Gangagen Biotechnologies, a hospital and healthcare company based in Bengaluru, Karnataka.

The speaker focused on the various career opportunities in India after studying MSc Microbiology. She stated that at present, the scientific knowledge, problem-solving, and analytical skills of microbiology graduates are sought after by employers. Currently and in the post coronavirus era, there is a wide scope in the field of microbiology

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because of the advancement in the field of science and technology and the need for research on deadly disease-causing microorganisms.

She also emphasized that with a degree in microbiology, one can get opportunities in various environments like higher education institutions, hospitals, healthcare organizations, forensic science laboratories, environmental organizations, publicly funded research organizations, pharmaceuticals, food and drugs, and many other industries. Job prospects, Competitive exams, average salary, funding agencies for microbiological research was also discussed.

The session had witnessed enthusiastic participation from students. Numerous queries were entertained during the session and participants actively involved themselves in gaining insight on how to be productive in their future endeavour. The good conduct of the session was recognized by the Resource person and the department.



Teachers of Microbiology Department and Shri S Sarma IQAC Coordinator Students of the department attending the webinar in the offline mode

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A POPULAR TALK ON THE TOPIC

THE PERFECT STORM, RESISTANCE IN E. COLI

BY

DR MARK TOLEMAN, CARDIFF UNIVERSITY

On 11th December, 2018, a popular talk on the topic the perfect storm, resistance in E. coli, was organised at the Shillong College Conference Hall in collaboration with National Academy of Sciences, India, North East Chapter.



The speaker, in the presence of Prof. SR Joshi, Department of Biotechnology, NEHU, highlighted the emergence of New Delhi Metallo Beta Lactamase (NDM) producing Escherichia coli and the gene encoding the production i.e. the *bla_{NDM-1}* gene. These enzymes are zinc dependent and

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therefore termed as metallo-beta-lactamase. NDM-1 is a carbapenemase beta-lactamase enzyme that hydrolyzes and inactivates carbapenem antibiotics.

Carbapenemases are particularly dangerous resistance mechanisms, since they can inactivate a wide range of different antibiotics. The NDM-1 enzyme is one of the class B metallo-beta-lactamase. Other types of carbapenemase are class A or class D beta-lactamases. The class A *Klebsiella pneumoniae* carbapenemase (KPC) is currently the most common carbapenemase, which was first detected in North Carolina, United States, in 1996 and has since spread worldwide. An Enterobacteriaceae that produce KPC were becoming common in the United States.

Thank You, Dr Mark Toleman from Cardiff University, England. The first person British scientist to visit and lecture Microbiology students of Shillong College. We remember you.



Dr. Mark Toleman and Prof. SR Joshi sharing their little secrets.

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ONE DAY FAMILIARISATION

WITH NEHU

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITIES

On the 4th December 2017, the 4th and 6th Semester of Department of Microbiology, Shillong College along with the teachers had a study tour to NEHU – SAIF. After travelling for about 30 minutes, we reached the venue around 11:40AM where more than 50 students attended the said tour. After we arrived at the campus, students are divided into three groups along with the teacher as mentor. We proceed into different instrumentation room with the instructor from SAIF.

The professors and Techniocal Assistant from the SAIF were kind and humble. They devoted their useful time to be with us for interaction. They taught us briefly about different Instruments and facilities. We were first shown Mass Spectrophotometer and briefly introduce how it was operated to determine the molecular weight of analyte.

Our group were then introduce to the preparation of sample for SEM and finally enter Scanning Electron Microscope (SEM) room. The instructor taugh us how to handle SEM and also the important function and its uses.



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Next we entered the well equip laboratory where instrument called ICP-OES was placed. Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) is an established and powerful technique for simultaneous analysis and quantification of trace elements in both liquid and solid samples. It is based on the core advanced technologies to solve the challenges of the most demanding laboratory applications. It is a type of emission spectroscopy that uses the inductively coupled plasma to produce excited atoms and ions that emit electromagnetic radiation at wavelengths characteristic of a particular element. During analysis the intensity of the light emitted at specific wavelengths is measures and used to determine the concentration of the element(s) of interest.

Lastly, TEM which was located in the ground floor was shown to us. TEM images are formed using electrons transmitted through ultra thin section (50-90nm), thin film or powder. The achievable magnification of the TEM can be from 50X to 1,500,000X and resolution of 0.19 nm depending upon accelerating voltage. The images can be viewed over a fluorescent screen and recorded on a photographic film or a high resolution CCD camera.



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HEART CARE AWARENESS PROGRAMME

ORGANISED BY

HEALTH CARE COMMITTEE AND MICROBIOLOGY DEPARTMENT

IN COLLABORATION WITH

HEART CARE SOCIETY OF ASSAM

Heart Care Awareness Programme was conducted on the 31st August 2017 at Shillong College Conference Hall. An eminent Cardiologist Dr. N.K Bhattacharjee, was the resource person of the said programme. Dr N.K Bhattacharjee is an international personality who used to deliver his popular lecture abroad. He had written and published a number of booklets, articles and brochures for public on heart and Health Care. His best-selling book "HOPE for HEARTCARE" earned wide acclaim including that from Dr. APJ Abdul Kalam, the then president of India and luminaries from the country and abroad.



Dr. K.D Ramsiej, Principal, Dr. M. Dey, vice principal, Mrs Mary Diengdoh, Convener, Zoliansanga, Head of Microbiology department, Pynhunshisha Kharkrang, Ibandarisuk Lyngdoh, Wankasaki Lytang, Amina Marbaniang, Kyntiew Lartang, Extra Kutkalang and Wanda Sohliya, members of the committee were also present along with a good number of professors and students of Shillong College.

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Dr. N.K Bhattacharjee, Senior Consultant Cardiologist, The founder of Heart Care society Assam elaborately explained the causes and prevention of Cardio-Vascular Disease (CVD) and other Heart related diseases and its prevention.

An interactive session was also conducted where a good numbers of students and professors participated

The programme ended with a vote of thanks delivered by Sir Zoliansanga, Head Department of Microbiology and light refreshment was served to the participants and staff of the college.



Group Photo of the Principal, Shillong College, Faculty member of Microbiology Department, Health Care Committee Member and Heart Care Society Member.

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INDUSTRIAL VISIT TO CENTRAL DAIRY AND ICAR COMPLEX ON 8TH OF JULY, 2014



Group photo at Central Dairy



Students entering ICAR Main Gate



Lecture given by Quality Control Manager



Briefing of students by scientists



Milk adulteration lab



Milk processing unit

On 8th July, 2014, Department of Microbiology left Shillong College at 9am by bus for an industrial visit to Central Dairy Mawiong, East Khasi Hills and ICAR Complex, Barapani.

Central Dairy Mawiong, East Khasi Hills is an establishment of Animal Husbandary and Veterinary Sciences, Government of Meghalaya. It was established in 1988. IT is a processing plant with a handling capacity of 100,000 litre per day. Apart from processing fluid milk, the plant is also design for manufacturing of milk products viz. cream, butter, ghee, ice-cream. The milk which has

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been processed at Central Dairy is dispatched to the consumers all over the town in the name of the **District Milk Procurement and Marketing Agency (DMPMA)**. The milk is also sold to the retail shopkeepers through registered wholesale distributors.

The milk used at Central Dairy is supplied by the **Primary Milk Producers Cooperative Society (PMPCS)** of Mawlai area, Ri- Bhoi area, Mawklot and Upper Shillong area. On reaching the dairy, the milk from all the four areas is again tested for acidity, fat and SNF after sampling. The milk which has been brought to the plant is immediately chilled at 4°C with the help of a Plate Chiller. It is then pasteurized in a Plate Heat Exchanger.

Presently, Central Dairy is under the direction and control of a government gazetted officer designated as Quality Control Officer Mr. Kevin M. Lawriuing having the qualification of Dairy technology.

On reaching Central Dairy, Mawiong at 10:00am on 8th July, 2014, we were received by the manager and we were divided into two groups accompanied for convenience.

The first group visits the milk adulteration detection laboratory where we were briefed by the lab assistance with regards to the common adulterants of milk that includes- urea, starch, neutralizers, detergent, sugar, glucose-dextrose, NaCl, acidity and heat stability, hydrogen peroxide, Mastitis and formaldehyde test. The lab assistant also showed the detection for the lipid-profile of milk.

The visit of the lab was followed by entering into the main or central milk processing unit where we were introduced into the processing of skimmed milk. Here, there were pasteurization vessels/tanks. Then we reached the cold storage where temperature is maintained at 4°C where the goods were temporary kept before dispatched towards the market through vehicles and we proceed to ICAR Complex, Barapani.

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Lastly, we were sorry to mention the Central Dairy Shillong never ever carried out the microbiological analysis of milk so, it is highly recommended from our side that a well equipped microbiological laboratory for the safety of the consumers with regards to milk borne diseases like T.B. (*Mycobacterium bovis*), Mastitis, etc.

ICAR Complex, Barapani: On reaching the ICAR Complex, Barapani we were received by Mr. R. Bhuyan, Technical officer, gives us a warm welcome at the main gate and take us to various departments- Biotechnology, soil science, etc. there, we meet various agricultural scientists briefing us on various techniques of soil analysis, microbial flora and fauna of soil, soil texture, soil pH, soil moisture content, nutrient parameter, phosphorus, urea and nitrogen content of soil.

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LIBRARY TOUR 2009

ORGANISED BY

DEPARTMENT OF MICROBIOLOGY AND SHILLONG COLLEGE LIBRARY

A library tour was conducted jointly by the Department of Microbiology and Shillong College Library on the 12th August 2009. The following interesting sites were visited –

(a) Don Bosco Museum , Mawlai, Shillong



(b) State Central Library, Shillong



(c) Nehu Central Library, Shillong



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Altogether 15 students of B. Sc. 1st Year Microbiology participated in the tour together with three Librarian Staff namely Smt. Betbhalin Lyngdoh, Shri. Mangbha Niangti and Shri Tulsi Babu.

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