



GREEN SKILL DEVELOPMENT PROGRAMME (GSDP)

Report on course:

Laboratory Assistants for Food Testing
Laboratory with Eco-Friendly Practices

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT,
FOREST AND CLIMATE CHANGE (MoEF&CC),
NEW DELHI



A report on Course: Laboratory Assistant for Food Testing Laboratory with Eco-friendly Practices

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Training to food laboratory technicians is a pre-requisite for ensuring quality and safety in analytical environment. Consumer Education and Research Centre (CERC), with the support of Ministry of Environment, Forests & Climate Change, launched a training programme on “Laboratory Assistant for Food Testing Laboratory with Eco-friendly Practices” under Green Skill Development Programme in 2018-19 to meet the growing needs of skilled manpower for industries and testing laboratories.

Market condition needs and assessment show that it is time consuming and difficult, especially for MSMEs to invest in training such technicians. At the same time the number of food processing units is growing rapidly so is the need for trained professionals. This training is aimed to train the science graduates to meet the growing demand of industries.

The CERC-ENVIS Resource Partner Consumer Education and Research Centre designed and developed this course to ensure widespread and effective delivery of training to food businesses with emphasis on green laboratory practices. This course has been designed for Science Graduates who have displayed a keen interest in technology and desire to gain the knowledge on global practices of food product testing laboratories and research institutes.

The first batch of the GSDP course was successfully conducted in 2018-19. The trainees either got jobs or went for higher studies. Second Batch of this course started from 7th January 2020 and completed successfully on 6th March 2020.

During the training, basic introduction and hands-on training was provided for various analytical techniques used in food laboratories. Introduction to –nutritional aspects, food safety standards and laboratory accreditation system – is given. Trainees are imparted knowledge regarding Good Laboratory Practices (GLP), sampling procedures, documentation; operation, calibration & maintenance of laboratory equipments. Information regarding eco-friendly laboratory, waste management and laboratory safety measures are also given through the course. The expected outcomes of the programme are:

- To create a Greenskilled personnel who can establish eco-friendly food laboratory methods.
- To be proficient in Eco-friendly Good Laboratory Practices
- To be well versed with sample preparation, operation and maintenance of laboratory equipments
- To gain basic knowledge of Food Regulatory Standards and Laboratory Accreditation
- To acquire knowledge about Laboratory waste disposal with as per sustainability criteria.

Since the training programme was designed to suit fresh graduates, the course covers introductory level of food science concepts, laboratory techniques and other analytical procedures. So, it made it simpler and easier to understand. Those with a higher qualification and/or experience were obviously quicker to learn and understand. However, it was ensured that all of them were able to gain from the training to a reasonable extent. This was ascertained by follow up laboratory exercises and assessment at the end of training. Most of the trainees expected to enhance their laboratory skills for better employment opportunities. Efforts were also made for career counseling and placement of candidates also.

Selection of Candidates

An advertisement is given in local newspaper and social media. Also released in <http://www.gsdp-envis.gov.in/>. Fifty three candidates applied for the course. Based on pan-India screening 15 candidates were finalized after written test and personal interview. All the trainees were Science graduates with chemistry/microbiology/botany/biotechnology/food technology. Candidates were either fresh or with experience.

Commencement of Training

An inaugural ceremony was organized at the campus of CERC. The Chief Guest was Sri. B.C. Raval, President, Indian Salt Manufacturers Association (ISMA). Sri Praful Amin, Chairman, CERC and Shri Uday Mawani, CEO and Project Coordinator ENVIS were also graced the occasion. Other dignitaries were Shri Atul Soni Laboratory Head Ahmedabad Municipal Corporation, Shri Mahesh Pandya, Paryavaran Mitra, and Shri Rakesh Shah, Director, Anand Environmental Consultants Pvt. Ltd.

The aim of this course was to impart requisite knowledge and skills, through classroom activity as well as hands-on training in CERC's in-house laboratory, supported by relevant industry visits. The faculty consisted of CERC's qualified and experienced laboratory personnel as well as a galaxy of visiting experts.

The whole training programme was conducted at in-house laboratory headed by Dr. Dolly A. Jani (Training In-charge). The faculty was efficiently strengthened by laboratory demonstrator- Ms. Kanaklata Goswami. The two months training was supplemented with two field visits to - Gujarat Pollution Control Board's Laboratory and Ahmedabad Municipal Corporation's Public Health Laboratory.

Training Manual

A Training Manual was prepared in order to train the personnel that can be designated as Technical Assistants in the food manufacturing and quality assurance sector. This manual details the requirements on safety and quality control to be practiced by personnel engaged in the food laboratory. It is based on the requirements of Food Safety Standards Regulations, 2011 along with the industry best practices. It has been designed according to the flow of operation in the food industry for ease of understanding of the laboratory staff.

This comprehensive manual is supplemented with standard operating procedures specific to the food laboratory for facilitating the trainers.

The manual is structured to provide essential information in a standardized, logical and systematic manner while adhering to effective teaching and learning strategies. It is composed of three sections. Initial Chapters-(1-14) elaborate on principles and methods of Good Food Laboratory Practices; Chapter-15 introduces and elucidates the safety requirements in a chemical laboratory; and Chapter-16 explains the environment friendly practices for laboratories and their criteria. Each section has a specific training module which is customized to meet the specific needs of the trainees.

Course Module

The course comprised of four weeks each of classroom lectures and practical training. The concluding sessions entailed a week of assessment and related exercises. Thus a total of nine weeks or approximately two months course schedule was lined out. The main components of the training curriculum were as mentioned below:

1. Introduction of Food, Nutritional Aspects and Safety Standards.
2. Introduction of Laboratory Accreditation
3. Eco Friendly Maintenance of Laboratory Practice
4. Eco Friendly Laboratory Waste Management
5. Introduction of Basic Laboratory Safety Equipment and their functions
6. Exercises and Assessment

Lectures/ Practical- The training was systematically carried out according to the topics lined out in the course module. Each student was provided with a training kit consists of- Training Manual; general stationery items; laboratory protection gear such as aprons, safety goggles, gloves and napkins etc. The lectures and practical sessions were continually held for nine weeks as per the descriptions in the Training Manual. Various aspects of food testing and good laboratory practices were covered in details via this training.



Hands on Training at the Food Laboratory at the Consumer Education Research

Field Visit I: February 19th 2020. A study tour was arranged to Sophistication Analytical and Research Laboratory (SARL) of Gujarat Pollution Control Board (GPCB) at Gandhinagar. The students were benefitted from getting a closer look and hands on experience of the world class facility for environmental and scientific analysis with NABL accreditation. The state of the art environmental laboratory is equipped with advanced scientific instruments and essential supplementary facilities that would help all stakeholders in analysis of wide range of environmental samples. The highlights of the visit were:

- Exposure to analysis of environmental samples like water (ground, surface, sea, waste) sludge, soil, industrial, domestic effluents, agriculture and food samples;
- Well experienced and adequate scientific staff;

- Demonstration of the working on sophisticated instruments:
 - High Resolution Gas Chromatograph – High Resolution Mass Spectroscopy (HRGC-HRMS)
 - X-Ray Diffractometer (XRD)
 - High Performance Liquid Chromatography and Triple Quadra pole Mass Spectroscopy (LCMS/MS)
 - Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)
 - Gas Chromatograph with Nitrogen Phosphorous Detector (GC-NPD) and Flame Photometric Detector (GC-FPD)
 - Volatile Organic Compound (VOC) Analyzer-Bench Type
 - Gas Chromatograph with ECD, FPD and FID
 - High Performance Liquid Chromatography (HPLC)
 - UV-Visible Spectrophotometer
 - Spectrofluorometer



GSDP Trainees at GPCB, Gandhinagar

Field Visit II: February 28th 2020: A studytour was also arranged to Public Health Laboratory of Ahmedabad Municipal Corporation with state of the art food testing facilities. This is an NABL accredited laboratory in chemical and biological scope of activities. It is presently headed by Dr. Hiren Mandlia and supported by Technical Officer Mr. Vimal Shah and qualified Food Analyst Ms. Isha Desai.

The training at AMC Laboratory included hands on training for test parameters to check purity and quality of oils and fats. The trainees were also benefitted to know about the working process of the sophisticated equipments on the premises. They were explained the process of sample receipt, coding, testing and reporting procedures as per NABL guidelines. The students were also given a demonstration of the tests for adulteration in common food items.

The trainees were required to submit their field visit reports after each study tour.

Seminar/presentations: External faculty/ experts were invited to take up sessions on

- Introduction to NABL, its importance and requirements;
- Role of Bureau of Indian Standards
- Entrepreneurship: How to start your own laboratory
- Finance and banking: How to get loan and different schemes of government for entrepreneurs.
- Misleading Advertisements: How to make aware of false claims
- Cleaner and Greener Production
- Carbon Footprint and Environmental Audits

Evaluation and Assessment

Trainees were assessed and evaluated on the basis of a written test and a practical examination. They were also graded for their respective field reports, journals and performance in the viva-voce.

Valedictory Function

To conclude the two- month training programme a valedictory function was organized at Ahmedabad Management Association on 6th March 2020. The chief guest of the day was Shri K.B. Vaghela, Head of the Laboratory, Gujarat Pollution Control Board, Gandhinagar. The guest of honour was Smt. Dipika Chauhan, Dy. Commissioner, Food & Drug Control Administration, Government of Gujarat. Presidential speech was delivered by CERC's Chairman Trustee Shri Praful Amin. The ten trainees were finally awarded with certificates jointly given by Ministry of Environment, Forests and Climate Change, and CERC upon successful completion of their training programme.

Placement Activity:

A placement brochure was prepared with the detailed bio-data of all the trainees and it was circulated to prospective employers such as Testing Laboratories, Food Industries and Research Institutions etc.

Success Stories:

Two trainees successfully placed with Food Laboratory of Consumer Education & Research Centre and Indian Red Cross Society, Gujarat Chapter as lab technician.

Three trainees opt for higher education.



GSDP Trainees at Municipal Corporation’s Public Health Laboratory

Testimonials

- After the training at CERC for 2 months, i feel well equipped to be a lab assistant at the Food Testing Laboratories. It was very interesting to know different aspects of food testing. I am very thankful to CERC-ENVIS team, for giving me this opportunity. It will definitely help me in building my career

-Hetu Patel

- During the training, we were taken to visit well equipped laboratories of AMC and GCPC. Wherein we got an opportunity to understand the working principles of many sophisticated analytical instruments. Expert lectures from external faculties on NABL Accreditation, CRM, Environmental issues; financial aid for startups etc was very informative and useful. This was a once in a lifetime opportunity of which I am very thankful.

- Imrankhan Pathan

- Here, I got an opportunity to enhance my knowledge on food adulteration, FSSAI regulation and Acts. We also got introduced to some of the instruments like HPLC, GC, ELISA, and Spectroscopy etc. I am thankful to CERC for providing me with this opportunity.

- Neha Ojha



Group Photo of GSDP 2019-20 Batch of “Laboratory Assistant for Food Testing Laboratory with Eco-friendly Practices” Course



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