



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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To meet with the growing needs of skilled manpower of industry as well as testing laboratories, Consumer Education and Research Centre - Resource Partner (CERC-RP), with the support of the Ministry of Environment, Forests & Climate Change (MoEF&CC), conducted training course on **“Laboratory Assistant for Food Testing Laboratory with Eco-friendly Practices”** under the Green Skill Development Programme (GSDP).

The aim of this course was to impart the requisite knowledge and skills, through classroom activity as well as hands-on training in CERC’s 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 two-month course culminated in a joint certification by Ministry of Environment, Forests and Climate Change and CERC after due evaluation.

The first batch of the training was scheduled from 1st July 2018 to 31st August 2018 at CERC, Ahmedabad, Gujarat. An advanced evaluation for registered Master Trainers was followed up in the month of September 2018 also in CERC campus.

Objectives and Expected Outcomes

Training to food laboratory technicians is a pre-requisite for ensuring quality & safety in analytical environment. CERC and CERC-RP have designed and developed this course to ensure widespread and effective delivery of training to food businesses with emphasis on green laboratory practices. This training is aimed at certifying the laboratory personnel as it is envisaged to make this a regulatory requirement under the GSDP.

As evident, this programme caters to the growing needs of the food sector. 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 candidates were selected on the basis of qualifying a written test followed by an interview.

During the training, they are being given the basic introduction and provided hands-on training in various analytical techniques used in food laboratories. They are introduced to – nutritional aspects, food safety standards and laboratory accreditation system. They have been imparted knowledge regarding Good Laboratory Practices (GLP), sampling procedures, documentation; operation, calibration and maintenance of laboratory equipments. Information regarding eco-friendly laboratory waste management and laboratory safety measures is also given. They also got hold of

an introduction to entrepreneurship education. The intent was to expose students to perceive their own entrepreneurial self-efficacy and entrepreneurial intent.

The expected outcomes of the programme were:

- To create a Green Skill 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.

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 & quality control to be followed 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. Chapters-(1-14) elaborate on the 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 its 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 Equipments and their functions
6. Exercises and Assessment

Commencement of Training

The training program was initiated on July 2, 2018, during which orientation was given and introductory sessions were held for the first batch of trainees consisting of eleven candidates.

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



The formal inaugural ceremony was held on July 3, 2018 at Ahmedabad Management Association, Ahmedabad. The Chief Guest of the programme was Dr H.G. Koshia, Commissioner of Gujarat State Foods & Drugs Control Administration (FDCA), Gandhinagar.

Field Visit I: August 7, 2018. A study tour was arranged to Gujarat Pollution Control Board (GPCB)'s Sophistication Analytical & Research Laboratory (SARL) at Gandhinagar. The students 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 with essential supplementary facilities that would help all stakeholders in analysis of wide environmental samples. The highlights of the visit were:

- Exposure to analysis of wide 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:
 - 1) High Resolution Gas Chromatograph – High Resolution Mass Spectroscopy (HRGC-HRMS)
 - 2) X-Ray Diffractometer (XRD)
 - 3) High Performance Liquid Chromatography and Triple Quadra pole Mass Spectroscopy (LCMS/MS)

- 4) Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)
- 5) Gas Chromatograph with Nitrogen Phosphorous Detector (GC-NPD) and Flame Photometric Detector (GC-FPD)
- 6) Volatile Organic Compound (VOC) Analyzer-Bench Type
- 7) Gas Chromatograph with ECD, FPD and FID (GC-FPF & FID)
- 8) High Performance Liquid Chromatograph (HPLC)
- 9) UV-Visible Spectrophotometer
- 10) Spectrofluorometer



Field Visit II: August 14, 2018: A study trip was arranged to Ahmedabad Municipal Corporation (AMC)'s Public Health Laboratory with state of the art food testing facilities. This is an NABL accredited laboratory in Chemical and Biological scope of activities.

The training included hands-on training for test parameters to check the purity and quality of oils and fats. The trainees were also shown around the sophisticated equipments. They 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 instructed to submit their field visit reports after each study tour.



Seminar/presentations: External faculties/experts were invited to take up sessions on – (1) Introduction to NABL – importance and requirements; (2) Entrepreneurship; (3) Finance and banking for entrepreneurs and (4) Misleading Advertisements.



Lectures/ Practicals - The training was systematically carried out according to the topics lined out in the course module. Each student was provided with a training kit consisting of- Training Manual; general stationery items; laboratory protection gear like 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.



Visitors from ENVIS Secretariat – Dr. Anandi Subramanian and Mr. Kumar Rajnish – dignitaries from Delhi paid a visit to CERC's training centre at the Laboratory on 14th August 2018. They interacted with the trainees and faculties in order to assess the ongoing training and also invited comments/ suggestions for future direction.



Evaluation and Assessment

The candidates 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. The entire exercise was scheduled and completed between 23rd and 30th August 2018.



Valedictory Function

To conclude the two-month training a valedictory function was organized at Ahmedabad Management Association on 31st August 2018. The chief guest of the day was Sh. Chandan Bahl, Director, Bureau of Indian Standards (BIS), Ahmedabad. The presidential speech was delivered by CERC's Chairman Trustee Dr. V.G. Patel. The trainees were awarded certificates upon successful completion of the training programme.





Placement Visits: A placement brochure was prepared with the CV's of all the trainees and it was circulated to prospective employers such as Testing Laboratories, Food Industries and Research Institutions etc. Arrangements were made to attend placement interviews/written test at the following:

- 1) Gajanand Foods Pvt. Ltd, Santej
- 2) Kanhai Foods (Kalory Bakery Products), Thaltej
- 3) Daffodil Pharma, Navrangpura
- 4) Posy Laboratory, Sarkhej
- 5) Uttam Dairy, Gomtipur

Subsequently, a few of the candidates were selected and offered placements in the above mentioned companies.

Master Trainer Evaluation

On the basis of their aptitude and performance during the two-month training course, four of the successful trainees were selected for the Master Trainer's programme. They were imparted one-week intensive coaching followed by theory and practical test respectively. They were assessed on their ability to train other candidates and thus qualify as skilled Master trainers.

Testimonials

I was very interested to know about the chemical aspects of food testing. The training included theory and practical sessions, which were conducted regularly. After two months I feel well equipped to be a lab assistant at food lab. Along with this, CERC even helped to get us interviewed at various companies- **Shreya Thakar**

The course was well designed and framed by the faculties of CERC- **Kruti Shah**

Apart from the course, we also got important information which helps me to shape my career- **Neha Kushwaha**

Practical aspect of the course has made me more knowledgeable which we were lacking in our graduate courses—**Manish Prajapati**



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