

**IN-PLANT TRAINING MANUAL
FOR
B.TECH. (FOOD TECHNOLOGY) STUDENTS
(2011)**

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IN-PLANT TRAINING MANUAL

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1. Preamble

Apart from the three and half years' of study, research, practicals and Experiential Learning Programme (ELP), the In-plant training provided to the students would further improve their entrepreneurial ability. With the advent of the ELP proudly coined, conceived and financed by the mostly eulogized Indian Council of Agricultural Research, the students have already developed their trade and the saying contemplated by the ANGR Agricultural University "*We want Job Providers rather than Job Seekers*", has come into limelight.

In spite of the fact that an enterprise entails several pre-requisites viz., Launching an Enterprise, Location to be chosen, Availability of Raw materials, Fuels, Quality control, Land, Labour, Capital, Organization etc.,-- Business analysis and Organizational Behaviour cannot be oblivious.

It is obsolete but not irrelevant that enterprising a cool drink shop in J&K or establishing a hair cutting saloon in Punjab can not be worthy.

The following pages absolutely find solution for attaining the aforesaid challenges.

2. Pre-requisites in Launching a Business Enterprise

- Product analysis and market survey
- Determining the size of the firm and plant
- Location
- Selection and organization of physical facilities
- Building the organizational structure
- Launching the enterprise
- Tax planning
- Identify the further merits and demerits, if any.

3. Choosing the Location of the Industry

Location of the business is the most important factor influencing its success or failure.

I. Selection of the region: Selecting a region for setting up an enterprise is dependent on the following factors.

- Availability of raw materials
- Supply of labour
- Proximity to the product market
- Availability of transport facilities
- Supply of power
- Climatic factors

Government regulations and policies

Law and order

Existence of complementary and competitive industries

Discuss the above factors.

II. Selection of the exact site:

After the selection of the particular region, the problem of the choice of the most convenient site is relatively easy. The two important considerations to be taken into account are

Price of land.

Disposal of waste.

Discuss

- the above factors.
- whether the site is connected with road and rail or if there is river transport, with water transport etc.,
- whether the existing facility for disposal of water or effluent water is sufficient
- whether the available land is sufficient for purposes of the unit or not
- Determine the plant size (Large, medium & small scale)
- Observe whether the site is located in good surroundings.

4. Ownership of the Business Firm

Indicate the type of business firm whether it is sole proprietorship, partnership or joint stock Company or co-operative organization or state enterprise.

Give the characteristic features and rules and regulations of the industry.

5. Plant Layout

Plant layout primarily concerned with the internal set up of an enterprise in a proper manner. It is concerned with the orderly and proper arrangement and use of available resources viz. men, money, machine, materials and methods of production inside the plant.

Draw the layout of the plant and indicated the type of layout

6. Organizational Structure

Build up a hierarchy of positions with clearly defined authority and responsibility.

7. Procurement of Raw Materials

Material forms the major proportions of the final product and total cost of production. This is the most important constituent of the finished product and hence should be managed with utmost care. Material cost affects to a great extent the cost of

production and also the amount of profits which an entrepreneur ultimately gets. In many organizations material cost constitutes about 70% of the total cost of the product. An effective system of internal control should be introduced to keep materials cost within the limits.

Observations:

Indicate the type of purchasing

Observe the purchasing procedures followed by the company

How to determine the qualities of raw materials

Mention the sources of supply.

Indicate the type of store keeping.

8. Details of Processing Equipment

S. No	Name of the equipment or machinery	specification	supplier	Cost/price per unit	Purpose of the equipment/ machinery

9. Sources of Fixed and Variable Capital

The expression 'fixed capital' often considered to be analogous to fixed assets denotes the employment of capital in permanent assets and other non current assets. The fixed assets include land, building, plant, machinery and other fixed equipment, furniture and fixtures, vehicles, livestock etc., .The investment in the fixed assets is the first initial step in establishing a corporation. The investment in non current assets is also called fixed capital. They include long term receivable, advances to subsidiary or affiliate companies, good will, patents, copy rights, long term investment in other companies and prepaid expenses

Working capital refers to that part of the capital which is needed for the financing of working or current requirements of the company. Every company needs working capital for holding current assets like stock of raw materials, semi finished goods and finished goods, accounts receivable, bills receivable, salable securities and cash for paying current expenses like wages, salaries, repairs, interest, rent, taxes etc

Observe the sources of fixed and variable cost for your plant.

10. Products Manufactured

List out the products manufactured in the plant

S. No	Name of the product	Product specification	size	Nutritional labelling	Shelf life

11. Product manufacturing processes

Give the detail description of product manufacturing for all the products in the plant including process parameters

12. Cleaning and sanitizing operations

Sanitizer is a substance used to reduce the microbial load to an acceptable limit

Observations:

Observe various sanitizers used in the plant for example:

1. Heat
2. Acid brite or divosan active (5% paracetic acid)
3. Chemicals used and their role

13. Proximate analysis and quality control

The main objective of proximate analysis is to determine the proximate constituents of food. These constituents include parameters such as moisture, fat, crude fiber, ash, protein and carbohydrate content of given food products.

Quality control has the scientific control of products aimed at obtaining adequate information on all the factors or characteristics of a product affecting the quality of the product. In its broader sense it refers to the control of all variables encountered in the process of producing a satisfactory reliable and economic product.

Observations:

Estimate the proximate constituents of food products in your plant.

List out and explain all the quality control tests that are being conducted in your plant's day to day activities.

14. Application of HACCP System

Hazard analysis and critical control point (HACCP) system has been recognized by the Codex Alimentarius Commission as a tool to ensure the safety of food. HACCP is a scientifically based protocol that is applied directly to the food procurement, production and distribution process. HACCP / ISO 22000 food safety management system is a scientific, rational and systematic approach to identify, assess and control hazards during production, processing, manufacturing and use of food.

HACCP system controls hazardous elements in the food system such as contaminants, pathogenic microorganisms, physical objects (glass, metal and bone), chemicals (toxins, heavy metals and pesticide residues), raw materials, processing conditions, use directions for the consumer or storage condition. So HACCP consists of plan and system.

HACCP plan is a written document that is based on the principles of HACCP and that delineates procedure to be followed.

HACCP presents a good opportunity for the food industry for upgrading quality and bringing uniformity and consistency in their supplies to international market.

Discuss the following with respect to your plant:

Conducting a hazard analysis

Determining the critical control points

Establishment of specifications for critical limits

Development of monitoring and testing system to control critical point.

Establishment of corrective actions when monitoring indicates that a particular CCP is not under control

Establishing record keeping procedures for verification to confirm that the HACCP system is under control

Verification of HACCP system to confirm efficacy.

Apply HACCP system to three major products that are being manufactured in the factory.

15. Implementation of ISO 9000 and Food Safety Standards 22000 Series

ISO 9000 series of standards for quality management systems have been successful around the world for ensuring consistency in the quality of products. ISO 9000, ISO 9001, ISO 9002, ISO 9003 and ISO 9004 are popularly known as ISO series. The ISO provides guidelines for selection and use of standards in quality systems, while ISO 9001 to ISO 9003 deal with guidelines for external quality assurance purposes in contractual situations. ISO 9004 provides guidelines for internal quality management purposes.

Observations:

Implement any one of the following standards for the products in your plant

ISO 9000, ISO 9001, ISO 9002, ISO 9003, ISO 9004, ISO 14000, food safety standards -22000.

16. Storage Facilities

Observations:

Describe in detail the types of storage methods and materials used in your plant.

Describe the details of cold storage, space, and calculate the capacity of cold storage and compare with the existing capacity.

State whether the existing capacity is sufficient or need to be increased.

17. Marketing

According to American Marketing Association marketing is an organizational function and set of processes for creating, communicating and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stake holders.

Observe the existing marketing strategies in the factory for different products manufactured.

Describe your plants unique selling proposition (USP)

Define your plants target markets and branding decisions

Write down the benefits of products and services of your plant.

Describe how the plant will position its products or services in the market.

Define the plants marketing methods, will it advertise, use internet marketing, direct marketing or public relations

Give the procedure followed by your plant for estimating the future demand for its products.

Give your suggestions to improve the sales in the market

18. Analysis of Cost of Production

To analyze the cost of production fixed and variable costs should be estimated for each product separately.

I. Fixed costs: Costs incurred on fixed assets like

- Land
- Building
- Plant
- Machinery
- Furniture
- Fixtures
- Vehicles
- Livestock
- Long term receivables
- Advances to subsidiary affiliate companies
- Good will
- Patents
- Copy rights
- Long term investment in other companies
- Prepaid expenses

II. Variable costs: Costs incurred on working assets like

- raw materials
- semi- finished / finished
- accounts receivable
- bills receivable
- salable securities
- cash for paying wages
- salaries
- repairs
- interest
- rent
- taxes

Total cost: Total fixed cost + total variable cost

Profit= Gross returns – Gross costs

Break even point interms of unit sales = $\frac{\text{Total fixed cost}}{\text{unit Sale price} - \text{unit variable cost}}$

Observations:

Estimate the total cost of production for all the products separately.

Calculate the profit

Find out the break-even point in terms of unit sales

19. Consumer Complaints

List out the complaints received from the consumers pertaining to the quality parameters

S. No	Nature of complaint received	Batch no. and date of manufacturing	Action taken by the company	Your suggestions

20. Effluent Treatment

Its major function is treating of the effluent generated in the plant operations. Effluent can be defined as anything that effects our environment causing harm where environment is the surroundings where we live in (air, water, nature etc). The major characteristic of effluent generated are high PH, high total dissolved salts, high total soluble sugars, high chemical oxygen demand, high biological oxygen demand, oil and greese.

Observations: Give the detailed description of effluent treatment in your plant.

21. Current Good Manufacturing Practices

Quality maintenance is the prime important factor for any food industry. Quality is maintained not only by using quality raw material but also subsequent handling should be good. These handling practices are called current good manufacturing practices.

Observations:

Describe the current good manufacturing practices that are being followed in your plant.

22. Boiler

Boilers are used for generating steam, which is used for various purposes in the industry. A steam boiler is a closed vessel in which steam or vapour is generated for the external use by direct application of heat produced from the combustion of fuel (Solid, liquid and gases) or by the use of electrical energy.

Observations:

Collect the data regarding the type, capacity of boilers, fuel type oil consumption etc.,

23. By- products and their Utilization

List out the by products produced in the plant.

Give the processing procedures for the by products of the plant.

Observe the market for the processed by products.

24. Management Information System

Collect the data regarding the monthly procurement of raw material, monthly production, monthly sales of previous year and current year and compare the trend. Show the graphical representation of the collected data and give the reasons for the ups and downs in the raw material procurement, production and sale of the products.

Observations:

I. Monthly raw material procurement

S. No	Months	Quantity procured
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

II. Monthly production:

S. No	Months	Quantity produced
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

III. Monthly sales:

S.No	Months	Quantity of product sold
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

25. Problems and Difficulties Encountered During the in-Plant Training

State the problems and difficulties encountered while undergoing the in plant training

26. Conclusion

Give the Suggestions for the improvement of the food industry where you are undergoing in plant training.

Give the suggestions for the improvement of in- plant training programme.

Note: Students have to prepare a detailed in plant training report of their respective Industries at the end of this programme based on the guidelines given in this manual.