

TECH-KNOWLEDGE

The Official PMG Engineering Newsletter



FOOD & BEVERAGE
INDUSTRY

ENGINEERING
& DESIGN

SCIENCE &
TECHNOLOGY

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SITE SELECTION AND LAYOUT



Introduction

How important can a site or location of construction be for factory? When technically looking - there is need to follow certain criteria required for site selection and it positively helps the manufacturing unit in various ways. Selection of suitable site for constructing a new manufacturing unit can be quite complicated due to factors such as location, climatic condition, soil type, utility availability, manpower availability and ease of constructability.

Selection Criteria

For selection parameter, certain parameter or factors might be more important than others but all major and minor points need to be kept in mind for selection. Below are the few points that shall help understanding the selection criteria.

1. Local Geography- Geographical area is important as different area abides to different government regulations, which can be strict at one and flexible at another, hence having knowledge and updated data shall help. If the process involves of high-water usage and draining, it is important to check the drainage facility of the local area and related laws and if they it fits in the requirements.

2. Daily Operations- It includes raw material incoming and finished goods outgoing from the facility. It is required to lay down few questions before constructing the facility at certain area- the most important being the source of raw material and the targeted market for finished goods. Does that require access to interstate or other country movement and what sort of transportation mode is, also to be defined, whether it will be road, rail, air, or water.

3. Utility and water availability and cost- Having your utility matrix ready at time of site selection helps. During site selection one just need to check the if the area will be able to suffice the needs of electricity, water and others and its availability. One should focus on reducing the cost incurred on getting utilities to facility.

4. Distance to Resources- Developing and having a strategic matrix for minimizing the transportation cost, by being at the hub of supply chain and raw material supply source.

5. Environmental Issue- It is crucial to understand the nearby area for any environmental issues.

A. There should be no garbage dump area in the nearby vicinity of the facility as t shall attract rodents, pest, and flies to the facility.

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B. Other Industry- In case the location has nearby industry, it shall be important to understand their chemical discharge, effluent discharge, and quality of air. Reason being chemical or effluent if consist of hazardous material, might contaminate the soil and water of the area that will indirectly affect the quality of the product being processed in your facility. Pollutant air being released will also affect the finished good product quality.

6. Labour cost and quality- Technology has profoundly emerged with using fully automatic plant with less human intervention for constant quality product, but still there are many factories that are depend on skilful workers for processing. Having skilful workers in the vicinity area of facility would add on the purpose.

In Food industry the supply uncertainty of raw material is extremely high, as they are dependent on factors such as season and site of production hence the best proposed location is always where risk can be reduced and mitigate risk.

Layout Planning

When designing the layout of your food industry facility, consider the following principles:

1. Flow of Operations: Plan the layout to facilitate smooth and efficient movement of materials, employees, and finished products. Minimize the distance between workstations and optimize the flow of production processes.

2. Hygiene and Sanitation: Ensure that the layout allows for easy cleaning and maintenance. Separate raw and cooked food areas and provide handwashing stations and sanitation facilities.

3. Safety Measures: Implement safety protocols, emergency exits, and fire safety measures in the layout. Minimize hazards and create clear pathways.

4. Equipment Placement: Arrange the equipment in a logical order that maximizes efficiency and minimizes cross-traffic.

5. Storage Space: Allocate sufficient space for storage of raw materials, ingredients, packaging materials, and finished products. Consider temperature-controlled storage for perishable items.

6. Flexibility and Expansion: Plan for potential future growth and expansion. Design the layout to accommodate changes in production volume and product range.

7. Employee Comfort: Create a comfortable and ergonomic workspace for employees. Consider factors like lighting, ventilation, and break areas.

8. Compliance: Ensure that the layout complies with local health and safety regulations, building codes, and industry standards.

In conclusion, site selection and layout planning are critical steps that can significantly impact the success of a food industry business. Careful consideration of these factors will help you create an efficient, safe, and profitable operation. Consulting with experts in food industry design and seeking professional advice can also be beneficial in making informed decisions.

PROCESS MANAGEMENT SYSTEM FOR PATHOGEN CONTROL



Introduction

Meat and meat products are important vehicle in the transfer of foodborne hazards as they are moist and rich in nutrients. Products contaminated with biological hazards poses most serious safety issues resulting in immediate consumer health problems and recalls from the marketplace. The microbiological quality and safety of meat products is compromised by system failures or abuses during food animal production, product processing and distribution, and preparation for consumption, as well as by consumption habits. Outbreaks resulting from the consumption of contaminated meat and meat-based products have made the regulatory bodies more stringent and led to the implementation of the hazard analysis critical control point (HACCP) process management system for pathogen control in meat products.

1. Pre - Requisite Programs and HACCP

The Hazard Analysis Critical Control Point (HACCP) system is a scientific approach to quality control. It is designed to prevent problems by making sure that controls are applied at any point in a food production system where hazardous or critical situations could occur. As a pathogen control management system, HACCP is based on the concept of establishing and managing controls following a complete hazard analysis. For improved effectiveness, the concept of HACCP should be applied throughout the food chain.

Proper hazard identification, selection of effective controls and detection of a deviation as it occurs are the basis for the success of HACCP in hazard control through prevention. Inclusion of steps to be taken when deviations occur assures quick and effective re-establishment of process control, and proper disposal of potentially hazardous product. For proper implementation and success of HACCP there is a need for commitment by top management, while effectiveness is based on proper employee education and training through appropriate standard operating procedures (SOP), i.e., job instructions. Governments, trade groups and the industry universally have accepted the HACCP principles.

Benefits of proper HACCP implementation include enhanced food safety assurance, better use of resources, timely response to problems and compliance with regulations, customer specifications and consumer demands HACCP is based on seven principles: hazard analysis; critical control points (CCP); critical limits (CL); monitoring procedures; corrective actions; verification procedures; and record-keeping/documentation procedures.

Further, HACCP needs to be established and implemented on a solid foundation of Pre-requisite Programs, which may also be known as "control points." These are defined as universal steps or procedures applied to control the environmental and operational conditions in a food establishment to produce safe food.

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Common Pre-requisite Programs in meat industry include: Good Agricultural Practices (GAP) or Good Production Practices (GPP); Good Manufacturing Practices (GMP); and Good Hygiene Practices (GHP). Important prerequisites deal with:

1. Facility premises and land history, including location and structure (design, construction, maintenance and working environment such as lighting, temperature, humidity, etc.);
2. Equipment and instrument design and standards, including maintenance and calibration services.
3. Foreign material control.
4. Control of utilities like water, ice, and air quality
5. Cleaning and sanitation programs and SSOP, including sanitary services, disposal of waste materials and provision of electricity, water refrigeration and steam.
6. Personnel training in hygiene principles and task accomplishment.
7. Specifications for raw materials, including live animals, food ingredients, chemicals, and packaging; product traceability and recall plans; documentation and maintenance of records; etc.
8. Additional Pre-requisite include purchasing requirements; supplier selection, certification and approval; product specifications; product storage and transportation; rework control; receiving, storing and controlling ingredients; pest control; allergen control; chemical control; personnel facilities; product identification, labeling, tracing and recall; and record and document control.

2. HACCP Implementation through Standard Operating Procedure (SOP)

Proper and effective implementation and management of food safety assurance processes needs adequate and proper implementation of validated and verified HACCP plans. This can be accomplished through development and implementation of SOPs or job instructions.



SOPs include procedures for each step in a process, procedures describing how each GMP and GHP is to be carried out, and procedures to be followed at each CCP.

In other words, SOPs describe in detail, how each activity is done. A complete SOP should address the following: describe the task to be accomplished; who is responsible for the job; when and how frequently the task is performed; the importance of the task; the steps involved in accomplishing the task; and provide guidance as to what should be done if a deviation or other problem develops. SOPs should be written in a way that is understandable to workers and should be used for personnel training to maintain consistency in HACCP implementation.

3. Validation of Critical Control Points (CCP) and Control Limits (CL)

Validation is a necessary component of HACCP, which may be considered as a form of verification. It is used to ensure that the CLs at each CCP of a HACCP plan are achieved or achieve their targets. Simply, HACCP plans and CCPs and CLs are validated to determine whether they are working as intended for the prevention, elimination, or reduction of food safety hazards. Validation may be based on scientific literature and/or historical data, regulatory requirements, or sometimes it may be necessary to evaluate CCPs as implemented within a processing operation to determine efficacy of an intervention through a validation study involving microbial challenge testing. Initial validation should be repeated when changes in processing occur or problems arise as determined by monitoring and verification.

4. Monitoring of Critical Control Points and Control Limits (CLS)

Regulatory bodies require that each monitoring step and its frequency be detailed in the HACCP plan. Monitoring the process step or intervention criteria and effectiveness ensure that the process is under control at each CCP.

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These activities consist of observations or measurements taken to assess whether a CCP is within the established critical limit parameters. Monitoring, continuously or frequently, must be sufficient to ensure the CCP is within the targeted range.

5. Verification of HACCP

HACCP verification principle is defined as activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan. Designing proper verification procedures, as well as hazard analysis, and identification of CCPs and CLs, are HACCP principles that require complete knowledge of the process as well as the hazards and their characteristics within each process. While validation covers the scientific and technical quality elements of the HACCP plan, verification covers procedures that determine compliance with the HACCP plan. As listed in the United States HACCP regulation, verification procedures include calibration of process monitoring equipment; direct observations of monitoring activities and corrective actions; and review of records generated and maintained within HACCP. Additional procedures used for verification in the United States and the European Union involve the determination of bacterial counts, such as Enterobacteriaceae or E. coli counts, as indicators of process hygiene. Verification should be designed to randomly determine that a meat processing plant is producing carcasses or meat within set microbiological criteria.

6. Microbial Testing

Microbial testing is an essential part of an effective program of monitoring pathogen presence in foods, and can be used to:



1. Detect pathogens in high-risk foods.
2. Verify effectiveness of process control measures.
3. Collect baseline information for evaluation of sanitation programs and trend analysis in raw materials.
4. Validate the effectiveness of pathogen interventions.
5. Identify where and when modifications to control measures are needed.

In general, the safety of meat products can be maintained and continuously improved if they are produced in facilities and with equipment that are intelligently designed for adequate cleaning and sanitation; follow good manufacturing and good hygiene practices and other prerequisite programs; apply processes by trained employees following necessary standard operating procedures; are managed by an intelligently designed HACCP plan in a company environment of food safety culture.



INDUSTRY BUZZ

Regardless of the lab's jurisdiction, referral samples may be delivered, according to the FSSAI.

According to a directive from the FSSAI, referral/appellate samples may be sent to any referral lab, regardless of jurisdiction. The decree states that regardless of their area of jurisdiction, "all stakeholders are at this moment requested to send Referral/Appellate samples to any Referral Food Laboratories as per their valid NABL scope." The food authority decided to make it open for all the appellate samples after receiving complaints about the region of jurisdiction's restriction from stakeholders, according to the FSSAI.

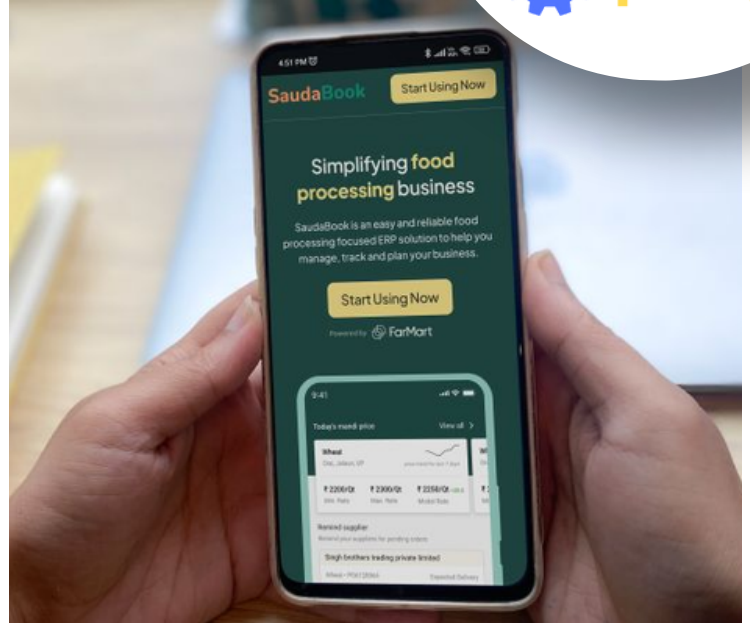
The Competent Authority has decided that the Appellate/Referral Samples may be sent to any Referral Laboratory as per their valid scope of testing, irrespective of the fact that the area of jurisdiction of these laboratories is limited and the range is dynamic as per the notification.

Britannia Milk Bikis introduces the Anaivarukkum campaign, which emphasizes variety.

An initiative by Britannia Milk Bikis to promote regional pride and Tamil Nadu's rich linguistic diversity is called "Anaivarukkum." The word "Anaivarukkum," which means "for everyone," honors the state's wide diversity of dialects. Each region Within Tamil Nadu has its distinct history, alluring beauty, respected figures, and diverse spoken dialects.

Milk Bikis' most recent campaign is a celebration that welcomes the uniqueness and depth of every region in Tamil Nadu, building on the brand's popularity among locals since 1978. This is Milk Bikis's way of thanking the government by shedding light on the subcultures inside specific neighborhoods and districts. The campaign displays the brand's extensive knowledge and respect for the state it acquired during its 40-year history.





Access to nutrient-rich crops must be made more widely known, claims Dwivedi.

To increase access to nutrient-rich crops, Maninder Kaur Dwivedi, Additional Secretary, Ministry of Agriculture and Farmers Welfare, Government of India, has emphasized the importance of industry. She continued that the ability to produce more variety of ready-to-eat foods that are tasty and acceptable in keeping with changing global taste belongs to corporations and industry.

Speaking at the FICCI-organized "Global Summit on Strengthening Food Systems for Nutrient-Rich Crops," Dwivedi noted that fortification has existed since the beginning of public health and possibly even earlier. "With greater information access and the effects of climate change, the urgency for it is now much more apparent and more vital. She emphasized that one solution is biofortification, which involves fortification not just after harvest but also before harvest.

With the introduction of Saudabook, FarMart provides its technology to all food enterprises.

FarMart, India's intelligent food supply network with the fastest growth rate, is pleased to announce the opening of its Saudabook tech platform. FarMart is making a significant move to modernize the nation's food industry by making its ERP (FarMartOS) available to all Indian food manufacturers and processors. It is India's first and only technology solution that is tailored exclusively for the food manufacturing and processing industry.

India's food production industry has long struggled with obstacles like poor automation, convoluted supply networks, and poor distribution. A \$500 billion market is substantially impacted by the nearly 3 million food processing businesses, many multigenerational family-owned businesses. Despite the industry's expansion, fueled by increased export opportunities and rising domestic consumption, there needs to be more automation and tech adoption.



Making beer: Enhancing your preferred beverage using regional components.

Craft beer has swept the world by storm because of its creative brewing methods, and an array of flavors, and India is no exception. India has seen a tremendous increase in the appreciation for and consumption of carefully brewed locally produced beers over the last several years. Beer fans are broadening their palates and setting out on a voyage of one-of-a-kind flavor sensations due to the variety of breweries opening up around the nation. The emphasis on using the best locally obtained ingredients is one of the most alluring features of India's craft beer movement. Every sip of Indian craft beer is an ode to our cultural history, from the enticing spices of Kerala to the delectable fruits of Himachal Pradesh.

In India, AB InBev and IHCL have opened a remarkable chain of Seven Rivers microbreweries, reinventing the beer-drinking experience. The first brewpub debuted in Bengaluru in 2020, while the Taj Holiday Village in Goa will host a second site in 2023.

WEEKS HIGHLIGHT



22 JULY

NATIONAL MANGO DAY

Celebrated every year on July 22, National Mango Day is solely dedicated to the delicious fruit that people love to eat, or at times drink, during the summer.



24 JULY

INCOME TAX DAY

Income Tax Day, celebrated on 24th July, recognizes the contribution of taxpayer towards economic development of our nation. On this day, in 1860, income tax was introduced by Sir James Wilson.



26 JULY

KARGIL VIJAY DIWAS

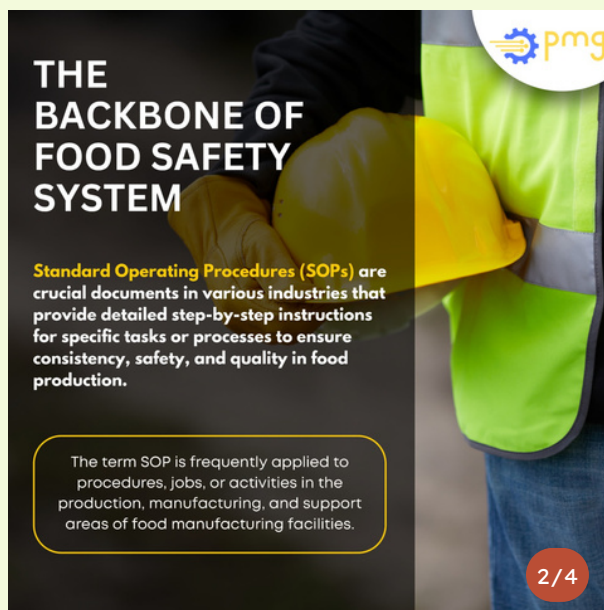
Kargil Vijay Diwas is celebrated all over India on July 26 every year to commemorate the emphatic victory in the Kargil War against Pakistan and honour the War Heroes.

DID YOU KNOW?



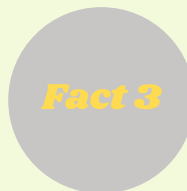
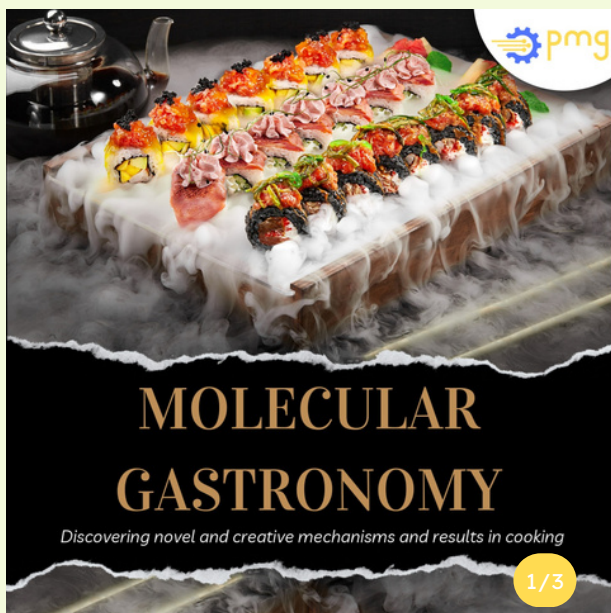
Fact 1

Sausages are perishable food items made from ground or chopped meat, along with spices, herbs, and other ingredients. The art of sausage preservation involves various techniques to extend their shelf life and maintain their quality like curing, Smoking, drying and fermentation.



Fact 2

Standard Operating Procedures (SOPs) are written documents that describe the step-by-step processes and procedures used in a food plant to ensure that food products are produced consistently and in compliance with regulatory and industry standards.



Molecular gastronomy is a scientific culinary discipline that explores the physical and chemical transformations of food during cooking. Techniques like spherification, foams, and sous-vide are commonly used to achieve unique culinary experiences.



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