

DEPARTMENT OF LIVESTOCK PRODUCTS  
TECHNOLOGY

DAIRY PLANT REQUIREMENT



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# INFRASTRUCTURE MILK PROCESSING PLANT

**The milk processing plant shall have the following essential facilities:**

- Milk Reception Dock / Milk Tankers weighing bridge
- Washing area
- Quality Control Laboratory
- Liquid milk storage area
- Processing Hall /area
- Products manufacturing area
- Packing area
- Cold storage area
- Utilities area
- Change rooms
- Waste water treatment plant area
- Vehicle parking area
- Input supply area
- Quarters and office area
- Cleaning and disinfection
- First aid area

# BUILDING CONSTRUCTION NOTE

## **Foundation:**

- A small plant will have 3 ft. deep firm foundation with RCC columns wherever necessary.

## **Floors:**

- Floors for milk/cream reception and dispatch dock should be of such type that they are impervious easily cleaned, able to withstand trucking and abrasion.

## **Processing room**

- may have hard burnt ceramic /terrazo (carborundum mixed) tile floor or concrete floor with silicon carbide sprinkled at the rate of 2 kg/sq.m. to give non-slip surface.
- For economy reason, if cement concrete floor is laid, then it should be treated with linseed or china wood oil to withstand action of acids and moisture.
- For all other rooms, cement conglomerate floors will do.

## Floor drains:

- Floor level of cream and butter processing room should slope towards drain.
- A slope of 0.75 inch per ft. will hold good.
- Sloping of the floor in one direction only, direct to the gutter, gives the quickest removal of drainage and spillages do not contaminate such a large area of the floor.
- Square type drains with flush joint at bottom are recommended.
- In cold storage rooms where cases are stacked or stored, the slope should be limited to 1/8" per ft.

## Roofs:

- R.C.C. roofs with adequate water proofing are quite satisfactory.

## Walls:

- Brick walls cement plastered and painted will suffice, except for processing room which may have ceramic glazed tile facing upto 5 feet height for sanitary and elegant look.

## Doors and Windows:

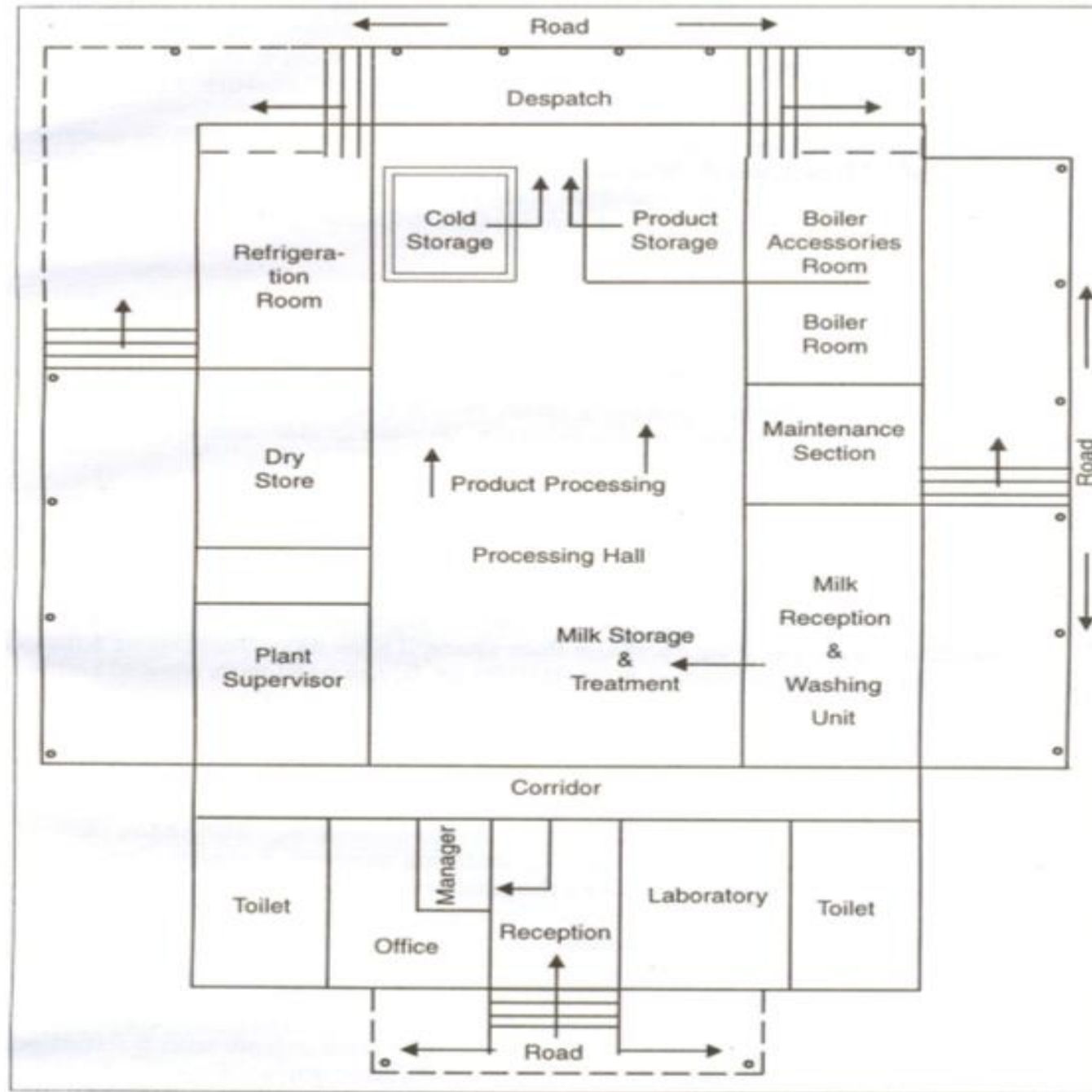
- Doors and windows and should be effectively screened and protected to exclude flies from processing room.
- Window area should be 20% of floor area for good ventilation and natural illumination.
- Wooden or steel doors well painted are satisfactory.

## Factory illumination:

- Sunlight has an injurious effect on cream and butter. Therefore, the lighting arrangements and layout

of the equipment should be such so as to avoid direct incidence of sun rays on the butter processing room.

- Skylights and windows with glazed glass are recommended as light will be diffused uniformly.
- Lighting in dairy factory should not be less than 1 watt per 2 sq. ft. of the floor space.
- These days fluorescent tubes - twin tube fitting with shade bracket 80 watts / 100 sq. ft. are used with normal ceiling height of 12 ft.

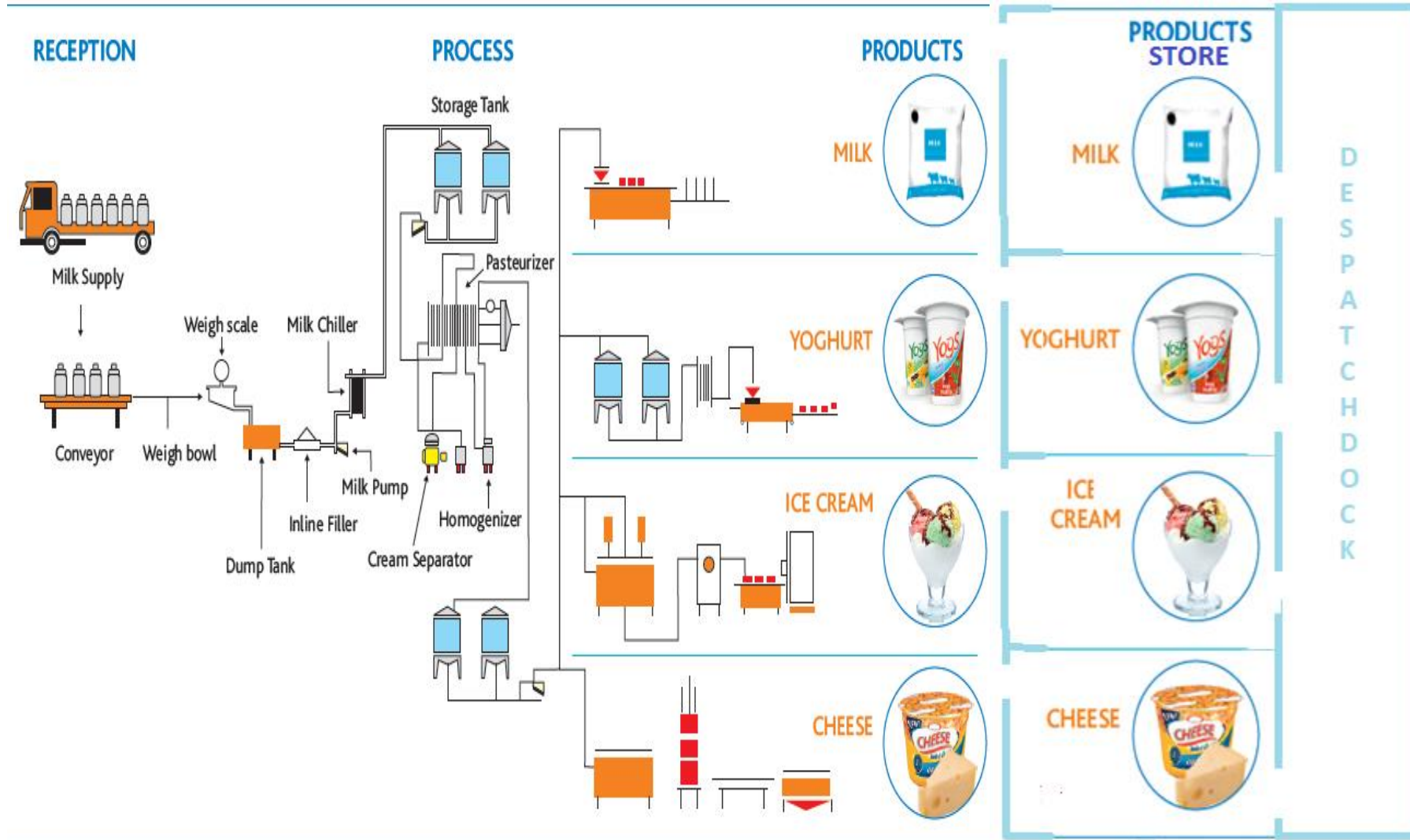


. Skeleton Layout sketch of a small dairy plant

# Dairy Plant Layout

Top management policies affect the plant layout as policies determine the plant layout objectives and scope of plant activities.

DAIRY PLANT REQUIREMENT



# LAYOUTS AND BUILDINGS

- ❑ The civil works includes factory building, quarters, office, garages, security post etc.
- ❑ The factory building for the milk reception, quality control, processing, packing and storage of milk products should be as per the BIS.
- ❑ The total covered area depends on the processes involved, products manufactured, the quantity of milk handled and the equipment chosen for services and product manufacturing.
- ❑ About 4000 sq.ft. area of building is required for handling 10000 liters of milk
- ❑ The milk processing plant shall have the following essential facilities.
- ❑ Milk Reception Dock consisting of can conveyor, can washer, weighting balance, dump tank etc.
- ❑ Processing Hall - cream separator, chiller, homogenizer, pasteurizer and other related machinery are installed.
- ❑ Storage area- for milk storage tanks.



- ❑ Products manufacturing area- depends upon the type of products and the quantity of milk handled, the required equipment needs to be installed.
- ❑ Packing area- for packing of liquid milk and other products.
- ❑ Cold storage- for keeping the milk and milk products before sending to market.
- ❑ Quality Control Laboratory-for testing the quality of milk and milk products.
- ❑ Utilities area- For installing boiler, generator set, water treatment plant, maintenance and store area for spares.
- ❑ Waste water treatment plant area- for treating the dairy effluents before releasing to the fields.
- ❑ Quarters and office area- for all the essential staff.
- ❑ Vehicle parking area- both for the milk procurement and distribution vehicles.

# PLANT MANAGEMENT

- ❑ Management is the optimal utilization of scarce resources to achieve the organizational objectives like prompt supply of quality milk, providing employment opportunities, protecting the growth and sustainability of dairy industry.
- ❑ It should aim at perfect human resource utilization, minimum energy consumption (water, electricity) and maximum utilization of equipment with assured quality production satisfying the consumer preferences.

# GOOD MANUFACTURING PRACTICE (GMP)

- ❑ Good manufacturing practice (GMP) is that part of quality assurance which ensures that products are consistently produced and controlled to the quality standards appropriate to their intended use and as required by the marketing authorization.
- ❑ GMP is aimed primarily at diminishing the risks inherent in any production, which may broadly be categorized in two groups: cross contamination/mix-ups and false labeling. Above all, manufacturers must not place clients at risk due to inadequate safety, quality or efficacy; for this reason, risk assessment (HACCP/ ISO certification) has come to play an important role in WHO quality assurance guidelines

# MILK PROCESSING

- ❑ Milk is collected by milk vendors in milk cans from farm's and transported to chilling centers or processing dairy plant.
- ❑ The milk is immediately cooled to 4°C within 2 hours of milking or the milk should be pasteurized and packed.
- ❑ The milk has to be pasteurized before marketed, except for products requiring raw milk at initial stages and or products need direct application of heat desiccation or other heating process.
- ❑ There is a consistent increasing demand for new products and processes. The major reasons are an increase in disposable incomes, changes in consumer concerns and perceptions on nutritional quality, hygiene and safety.

# VENTILATION

- ❑ Ventilation is necessary to allow an efficient control of air temperature in the factory, and to give a quick drying out of floors in the factory after they have been washed.
- ❑ If ventilation is not efficient, the steam liberated into the atmosphere during the various operation condenses on the wall and ceiling, and this condensed steam drips on to motors, belts and other equipment, causing them to corrode;
- ❑ wherever moist conditions persist, the growth of mould is encouraged.
- ❑ The ventilation may be carried out either by providing sufficient ventilators/sky lights or by forced draught.
- ❑ Use of exhaust fans is commonly favoured.

# PERSONAL FACILITIES AND TOILETS

- ❑ Personnel facilities shall include adequate means of proper washing and drying of hands before touching food materials including wash basins and a supply of hot and /or cold water as appropriate;
- ❑ Separate lavatories, of appropriate hygienic design, for males and females separately; and adequate changing facilities for personnel and such facilities shall be suitably located so that they do not open directly into food processing, handling or storage areas.
- ❑ Number of toilets depends on the number of employees (male /female) in the establishment and they should be made aware of the cleanliness requirement while handling food.
- ❑ Rest and refreshments rooms shall be separate from food process and service areas and these areas shall not lead directly to food production, service and storage areas.
- ❑ A display board mentioning do's & don'ts for the workers shall be put up inside a prominent place in the premise in English or in local language for everyone's understanding

# MAINTENANCE OF PLANT AND EQUIPMENT

- All milk contact surface should be sufficiently cleaned daily
- Equipment used for fat be cleaned & disinfected as required.
- Spray dryers and powder handling system be cleaned weekly.
- Wet cleaning should be carried out thoroughly & all parts dried before re-use.
- Atomizers of spray driers, dismantled cleaned and dried at least once in one production time.
- Cleaning in place be done by circulating suitable solutions in equipment which is not practical to dismantle
- Any equipment not used within 6 hrs of disinfection should be re-disinfected before use

# WORKERS HYGIENE AT PLANT

- Persons engaged in plant should be healthy, free from infections, cuts and sores.
- Employees should be trained in maintaining high degree of personal cleanliness.
- Smoking, eating and spitting in the processing area should be prohibited.
- Conduct a health checkup at periodical intervals
- Clean protective clothing (head cover, hand gloves and foot wear) should be used.
- No jewelry allowed in areas of product production or storage e.g.: Rings / necklaces / bracelets / earrings
- Hair clips / watches
- Glasses with jewel decorations



# THANK YOU

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REFERENCE:- OUTLINES OF DAIRY TECHNOLOGY; SUKUMAR DE