National Dairy Development Board
Food Safety required in Dairy Processing Facility

Guidance Document 1.0
Change Room Design Principles and Requirements

Effective Date: 16/09/2020 **Replaces:** New

PURPOSE

To provide guiding principles and requirements of sanitary design elements of Changing Room for Dairy Industry

General

Changing rooms fulfil key function of a single entrance to the food production area for all staff, workers, visitors, contractors, etc. in order to minimize product cross contamination. It serves as an area where;

- Employees can store external clothing and personal effects
- For maintaining personal hygiene and structured entry sequence by practicing use of PPE (personal protective effects)
- Facility for cleaning and laundering industry clothing and footwear's
- Segregated toilets from food production areas etc.

Requirements on Hygiene & Sanitary Practises

FSSAI has specified the requirement of personnel hygiene and changing facilities under FSS (Licensing and Registration of Food Business) R, 2011, Schedule 4, Part-II – at section 4.6 under "General Requirements on Hygienic and Sanitary Practices to be followed by all Food Business Operators applying for License". The Quality Mark guideline under Annex 5 Section 13; has specified the requirements of Changing room and Toilets for Dairy industry.

This guideline provides supporting descriptions of sanitary design elements of the Change room for dairy industry under following principles.

Introduction: Pre-requisites for maintaining hygiene in dairy industry for minimizing hazards
Principle 1 Functional requirement of Changing room
Principle 2 Basic layout of Changing room
Principle 3 Recommended Changing and Hygiene procedure ▪ Entry & Exit
Principle 4 Toilet facilities
Principle 5 Hygiene Stations for High risk food processing areas

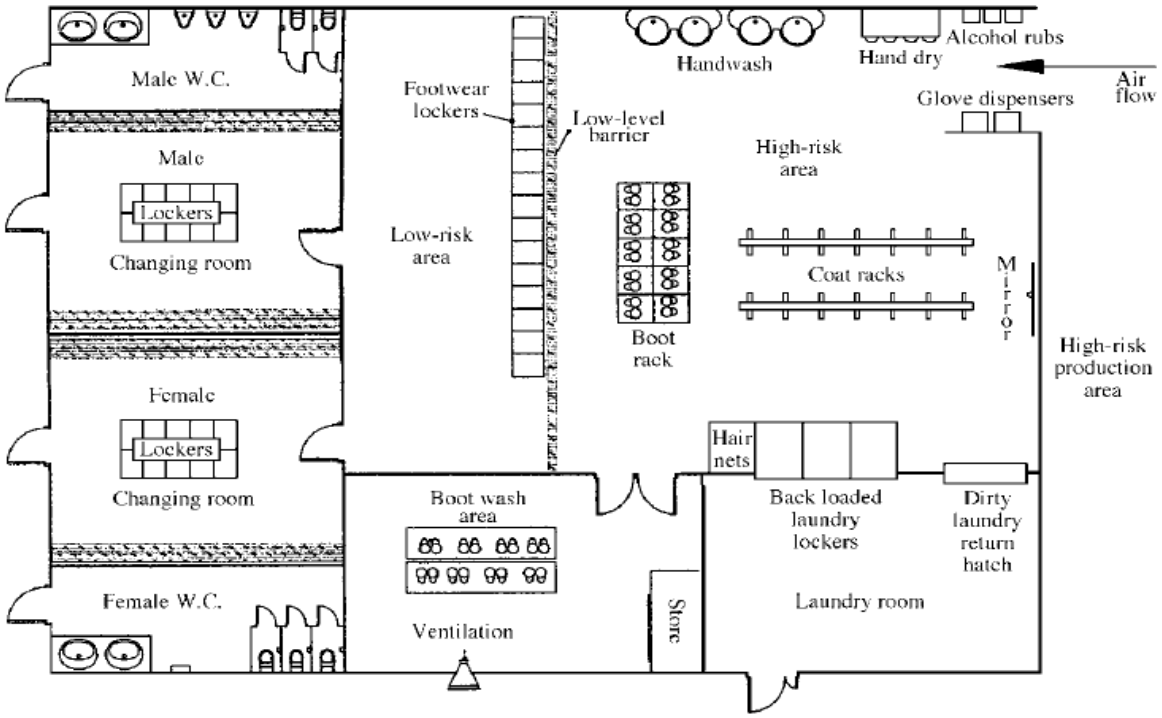
Introduction: Pre-requisites for maintaining hygiene in dairy industry for reducing hazards and minimizing cross contamination	
i	All dairy processing operations should be carried out in such a way that the risk of contamination of the dairy product or packaging materials by any hazard is avoided. Such hazards may include: • Physical/foreign matters (e.g. metal, glass, plastic, insects, dust/dirt etc.) • chemicals (e.g. allergens, cleaning agents, disinfectants, lubricants) Spoilage/pathogenic micro-organisms
ii	Two levels of internal barriers are required for dairy manufacturing processes; 1. The first level separates processing from non-processing areas. 2. The second level separates 'high-risk' from 'low-risk' within processing areas. **Non-food production areas**: Food production areas should be segregated from non-food production areas such as locker rooms, canteens, utilities, boiler rooms, workshops, machinery rooms, laboratories, offices, meeting rooms, Separation should be by physical means such as walls, sufficient to prevent contamination of food production areas by pests, particulates, gases and fumes. **Food production areas:** Products range from low risk – ambient stable, packaged foods.(eg. milk processing section, ghee section, peda section, etc) High risk includes chilled and other ready-to-eat foods. (eg. UHT milk filling section, cheese section, fermented milk product section etc.) In the production of these foods a variety of raw materials and processing conditions may be in place – introducing, eliminating or controlling different hazards.
iii	Hygiene zones should be clearly demarcated on the plant schematics with colours or other markings to facilitate easy identification of areas. — Non-food production areas — Food production areas (indicative) o Basic hygiene areas (Zone B) o Medium hygiene areas (Zone M) o High hygiene areas (Zone H)

	• **Basic hygiene areas (Zone B) is** the first zone of the food production area, in which raw milk (or raw materials) are initially processed. eg. dairy reception dock • **Medium hygiene areas (Zone M)** is where raw chilled milk is stored in silos are processed, packed and cold store. • **High hygiene areas (Zone H)** are for products, particularly those that are described as ready-to-eat, for which strict microbiological reduction process is undertaken/packaging of finished product. eg. UHT section, Butter section, Cheese section, Ice cream section etc.
iv	The level of air cleanliness as design specification of the air handling system reduce the risk of cross contamination of high risk product and hence, these areas may suitably have Heating and Ventilation Air Conditioning (HVAC for+ pressure) and air lock provided in between low & high risk areas for upkeep of hygiene.
v	Air shower may be provisioned before entry to the high risk processing sections such as Cheese section, Infant food section etc.
vi	Entrance from non-production to production areas is practised via changing rooms.
vii	Entrance into 'high-risk' areas is through a further ante-room specifically designed for high-risk operations (Hygiene station etc.).
viii	A single one-way flow of production operations from raw materials at the beginning to finished products at the end minimises the possibility of contamination.
ix	It would be better to provide swipe card system or rack, indicating total number of person entering or present inside respective section/plant
x	The facility is designed such that movement of employees, visitors, maintenance personnel and contract workers throughout the facility is controlled in a manner that does not contribute to potential cross contamination.
xi	Sanitary delivery of packaging materials, ingredients and rework to processing facility/high risk zones in a manner that does not contribute to potential cross-contamination. (Such as entry point control like de-dusting chambers)
xii	Sanitary removal of trash from processing facility/high risk zones to be channelized (dedicated personnel/travel paths)
Note: Milk tanker and delivery drivers, particularly if required to wait a long time between unloading/loading, should be provided with restroom and toilet facilities and a means of communicating with dairy staff (e.g. via a window). For visitors, best practice would be for them not to enter the food manufacturing areas; the use of vision panels and/or an external visitors viewing gallery/corridor can be facilitated.	

Principle 1 Functional requirement of Changing room	
1.01	A changing area is necessary to provide basic privacy i.e. separate areas for males and females with separate washroom facilities with proper ventilation.
1.02	Air Curtain to be provided as a barrier between external side and Change room
1.03	Self-closing doors, proper lighting and ventilation.
1.04	First aid kit to be made available.
1.05	The informative boards/poster with regard to required personal hygiene practices and fire/emergency exits to be displayed.
1.06	Cross over barrier/bench provided before entry into production area from change room.
1.07	Dairy clothing should be changed at the entrance of the unit and given to laundry at the end of the day. **Note:** Employees should not come to work (from home) in their work clothing nor launder their work clothing themselves.
1.08	Open lockers to store outside footwear.
1.09	Provision of individual storage facilities, e.g. lockers, is required to ensure that staff's outdoor clothing and personal effects can be securely stored for the duration of their work period. **Note*:*** As staff's personal effects may be contaminated, they also need to be stored separately from their dairy clothing.
1.10	Prior to putting on factory clothing, staff are required to undertake hand hygiene procedures to reduce the risk of cross-contamination to the food manufacturing area. This requires the provision of hand-wash sinks with detergent and hand drying facilities.
1.11	Hand washbasins to service a single hand wash. Hand wash basins must have automatic or elbow/foot-operated water supplied at a suitable temperature.
1.12	Suitable hand-drying equipment, e.g. paper towel dispensers or hot-air dryers. **Note:** Closed-circuit television (CCT)/cameras/sensors as a potential monitor of hand wash compliance may be installed.
1.13	Changing room may have definite barrier, which divides the external side of the changing room from the food manufacturing area. **Note:** This barrier can be a simple line on the floor or a bench that operators can sit on when applying footwear cover prior to swinging their legs over into the food manufacturing area.
1.14	Open lockers at the barrier to store low-risk footwear/industry foot wear/foot cover
1.15	Ensure availability of Sanitizer dispensers adjacent to high-risk production area.
1.16	After processing activities, facilities are required to hold used

	industry clothing either for laundering/cleaning and discard PPE (disposable– mask, gloves, hair net etc.).
1.17	An area designed with suitable drainage for boot washing operations.
1.18	Dairy unit should provide a laundry facility for its direct food handlers including contractor labour.

Principle 2 Indicative layout of Changing room



Indicative layout of low risk and high risk changing rooms

(Reference: Hygiene in food processing by H.L.M Lelieveld & et al. Woodhead Publishing Limited. Cambridge)

Note: Layout may be accommodated as per actual site condition.

Principle 3 Recommended Changing and Hygiene procedures	
i. Entry procedure	
01	Use the toilet facilities as required.
02	Wash hands.
03	Remove outside clothing and store with any personal possessions in lockers provided.
04	Remove footwear and store in footwear lockers.
05	Cross barrier into food processing side of changing room.
06	Put on protective clothing like apron etc.
07	Put on industry foot wears/foot covers.
08	Wash hands and sanitize.
09	Put on PPE like hair/beard net, masks etc.

10	Check appearance in mirror
11	Wash and dry hands and sanitize
12	Enter food production area.

ii. Exit Procedure	
01	Exit from food production area.
02	Discard single use PPE like hair or beard nets, mask etc.
03	Contain dairy clothing like apron etc. in "dirty laundry return hatch".
04	Enter boot wash area and store dairy foot-wears designated location.
05	Put on outside foot wear from foot wear lockers.
06	Use the toilet facilities as required.
07	Wash hands.
08	Put on outside clothing and any personal possessions stored in lockers provided.
09	Exit the Change room.

Principle 4 Toilet & wash basin facilities

Suggested number of lavatories, urinal stalls and hand wash basins per number of staff employed:

Staff number	Number of sanitary conveniences				
	Men			Women	
	Lavatories	Urinals	Wash basins	Lavatories	Wash basins
10	1	1	1	1	1
20	1	2	2	2	2
40	2	3	2	3	3
60	3	3	2	4	4
80	4	4	3	6	5
100	4	4	3	8	6
120	5	5	4	9	7
140	5	5	4	10	8
180	5	6	5	11	8
	Add 1 lavatory, 1 urinal and 1 wash basin for every 70 persons in excess of 280 persons			Add 1 lavatory, and 1 wash basin for every 35 persons in excess of 280 persons	

Source: D. Smith & J.Holah, Design of food factory changing rooms, chapter 29 from Hygenic design of food factories; Woodhead publishing ltd., 2011

Note:

- Toilets should have proper barriers and ventilation to minimise the risk of cross contamination.
- Toilets and its exhausts should never open directly into areass in which food or food packaging is handled.

Principle 5 Hygiene Stations for High risk food processing areas	
5.01	The most important factor for planning the Hygiene station is the number of employees who have to pass through the Hygiene station. The basic equipment of a Hygiene station includes: • Hand washing and hand disinfection devices • Sole cleaning and sole disinfection equipment • Shaft cleaning and shaft sole disinfection devices • Hand drying system
5.02	Non-contact sensor-controlled soap dispenser: doses an adjustable amount of liquid hand cleaner for hand cleaning.
5.03	Non-contact sensor-controlled hand wash basin with hot water supply is activated by a sensor for an adjustable time, integrated with paper towel dispenser followed by hand dryer.
5.04	Non-contact sensor-controlled hand sanitizer dispenser for 2-hand wetting, doses an adjustable amount of disinfectant into the hands for better hygiene.
5.05	By triggering the hand disinfection or hand cleaning, the one-time turnstile release is carried out by impulse; with optical signals for release detection (red cross = locked, green arrow = free). Hub: three-armed, electromechanically controlled.
5.06	Shoe sole cleaning by pressure activation
Note: For larger numbers of employees, it is recommend that, in order to avoid overcrowding at the beginning of shifts or shifts, separate steps such as hand cleaning and hand disinfection as well as sole cleaning and sole disinfection should not be combined in one device.	

Personnel hygiene regimes are critical in reducing the potential for food contamination incidents. The Dairy industry must suitably plan and design hygienic and cleanable changing rooms and equipment that facilitate these regimes and allow them to minimise cross-contamination to workers and the environment. The success of such regimes is still dependent on the actions of the Food contact handlers/workers.

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