Cauvery College for Women (Autonomous)

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Topic Covered : Food Plant Layout and Work Simplification

LAYOUT

The term layout in general means to display or to plan or to display according to plan. While the term layout" in relation to physical plant of a food service establishment means "the positioning of various work centers or areas (like receiving, storage, preparation, service, dining, washing and garbage disposal) and their arrangement with respect to equipment to other necessary services like drainage, electricity, water and fuel supply, etc in the physical structure of a food service establishment so that the various production cycle activities can be accomplished in a logical sequence smoothly For efficient, smooth functioning, any food plant layout irrespective of its size should be ideal.

Work areas Seven major types of work areas are generally provided for foodservice departments: They are receiving, storing and issuing (dry and cold stores) preparation, cooking, food assembly and serving, ware washing (pots, pans and dishes) and such supporting services as administrative work that requires office space, lockers and restrooms and such facilities.

GOODS RECEIVING AREA:

This an area where the foods and supplies purchased for the foodservice would be received before taken for storage. As items purchased in bulk need to be verified for quality quantity in order to avoid exploitation by the suppliers, it is considered as one of the most important areas in the entire layout. Regarding the location of this area, it could be preferably be placed at the backside of the operation, therefore it does not affect the main entrance where customers come and go. Also it need to be located adjacent to the store room, so that items received could be taken directly to the store room without much travel of goods.

SPACE LOCATION:

The size of this area does of course depend largely the type of the foodservice, the nature of goods being handled, the volume of food to be received at one time,

frequency of deliveries and the distance to storage areas, taking these factors into account, adequate space has to be allocated for this area.

EQUIPMENTS:

Regarding the equipments to be arranged in this area are concerned, the receiving area should include an outside platform, preferably covered with adjacent floor space where food is checked in, examined and weighed or counted. The height of the platform should be that of a standard trunk floor. 8 feet is suggested as a minimum width and the length of the platform is determined by the volume of supplies that might need to receive at one time. The receiving area should also be accessible from the street or highway and provide space for trucks to the loading platform or turn around. If a platform can't be constructed, a ramp can be used. The steps of platform or the ramp leading to the storeroom can have half steps to walk in and half can be in the form of slop (chute) on which either goods or trolleys with goods can be easily moved to the storeroom.

The same arrangement can be had in the platform. It is an area where products need to be examined for quality and weights need to be verified and invoices checked before the delivery person leaves. Therefore the receiving area needs to have both table model weighing scales and platform scales, as well as trolleys to transport supplies. Dust bins to throw garbage, furniture like tables and chair to sit and work rack to stores anything required etc, to carry out the function of receiving efficiently. The outside door either in the beginning of tie platform should be wide enough to allow the trolleys or hand trucks inside the stores,.6 foot single or regular double sizes door is suggested as normal door size.

STORAGE AREA:

Storage area is the one where goods and supplies are stored in spaces earmarked for particular materials, till they are required for use by the production, service, or any other user department of FSE. In any catering institution, the manner in which food equipment and cleaning materials are stored is of almost importance

since under any given situation 30-40% of the money in any operation would be stored in the form of goods. Hence well planned storage spaces would help to prevent losses of food and materials through spoilage, spillage or pilferage. All of which can cut the profit of the institution substantially. In any establishment the planning of storage space depends on the basic factors namely

1. Nature of food to be stored ie., the degree of perishability.
2. Length of time for which they have to be stored before use,
3. Quantities in which foods are required to be stored,

LOCATION:

Ideally, storage space should be located near the receiving area and adjacent to the preparation area and kitchen. But under unavoidable circumstances if the storage cannot be placed near the kitchen, in such cases the storage can be near receiving area in place, while in the kitchen it is advisable to have transit storage, Which can be fed from the main stores once in two or three days. Storage spaces need to be worked out according to the degree of perishability of foods.

Depending upon the speed with foods get spoiled. They are classified as perishable, semi-perishable, and non perishable, each are 2 type of storage specified for FSE. They are Dry or room temperature storage. Low temperature storage.

DRY STORAGE:

As the name suggest, dry storage is a place for the storage of dry ingredients usually stored at room temperature, regarding the space to be allocated for dry storage is concerned, it must be large enough to hold the maximum volume of ingredients to be stored. This in turn will depend on the variety of ingredients need to, be stored at one time, the frequency of deliveries, purchasing polices of the establishment etc. For example, an institution may require comparatively Tittle storage space when deliveries of supplies are made daily, whereas as institution receiving less frequent deliveries may need considerable storage space, The space for the dry storage can be divided into distinct categories meant for cleaning

supplies, miscellaneous store and so on, This kind of arrangement would help to ensure orderly storage of items,

EQUIPMENTS:

Dry storeroom should be cool and well ventilated. Other requirements are screened, metal or wood Shelves, covered storage bins for loose items, jars trolleys to carry things, platform scales, table model Scale, dust bins crates furniture and so on so that storage activity can be carried out effectively.

LOW TEMPERATURE STORAGE:

The principle underlying the designing of low temperature storage is to maintain temperature at levels which will inhibit the growth of micro-organisms thereby preserving the food. At high temperatures, microbial activity gets accelerated because perishable foods have a relatively high proportion of moisture, providing suitable humidity for spoilage to occur.

In ground, the space to be allotted for this storage depends upon a number of factors such as, The nature of foods included in the menu, (if less amount of perishable foods are used daily, less space is required) The purchasing policy of the establishment (if it purchases all the required perishable item on day to day basis, it doesn't require low storage where if it purchases once in 2 days or a week, it required this space accordingly to store them or if it purchases all perishable goods during season when price is less to have its advantage during off season, it requires more space accordingly).

The preparation policy of the institution (like if it has the policy of preparing items previous day wishes to store the leftover prepared food for next day it should have space for the purpose.

Three types of low temperature storage spaces are specified for food services namely, in order to avoid last minute tension, it has to have Low temperature space) and

1. Refrigerated storage (0 to 10®c) 2)
2. Cold storage (0 to 5@
3. Freeze storage (0 to -20®c)

Refrigerated storage

It is a storage space planned and maintained at a temperature between 0 - 10®c. This type of storage would maintain the quality of perishable foods for 2-5 days. This can be in the form of a piece of free standing equipment-refrigerator which is not generally considered as a storage space in food services or it can be in the form of a storage space called walk-in-refrigerator which is a room specially constructed to maintain the temperature. Of course the size of the room would vary as per the factors specified in the space allocation column for low temperature. Cold storage A cold storage is one in which the temperature n maintained between 0 and 5®c thereby reducing the enzyme activity to a minimum. Such storages are also called "chill-rooms" and can retain perishables in good condition over a week. This storage can also in the form of freestanding cabinet type or in the form of specially constructed walk-in-cold room.

Freezer storage

In this the temperature ranges from -20@c to 0Bc. The space to be allocated for this storage will depend upon the purchasing policy of the food services. Freezer storages may be part of the free standing refrigerator, or a free standing cabinet or a walk-in-freezer. For star category provision of this exclusive space in the layout is a must, while the ordinary institutions can plan according to their necessity.

Pre preparation area

It is the area, where items are prepared before taken to the main cooking area for final preparation.

Location

Regarding location of this area, it varies from institution to institution. In smaller ones, it would be part of the main cooking area (kitchen) while in the medium ones, it would be in the form of a partition blocked in the kitchen itself while bigger categories it would be an exclusively separated area, well equipped to carry out this work. In such cases, this area has to be located adjacent to the low temperature storage as well to the main cooking area.

Space allocation

The space to be allocated for this area depends on

1. Whether the preparation area is going to be one for all the types of pre-preparation work like vegetables, fruits, non vegetarians (if the institution serves both veg and non-veg items) salad and so on or it is going to be separate area for each type of preparation activity like vegetables, fruits, met, fish, poultry, salad etc.

2. The number of people to work inside the area.

3. The type, size and number of equipments to be used in the area.

4. Storage space to be provided in the area.

5. Purchasing policy of the food service that is if ready-to-cook, prepared items are purchased, it doesn't require this space.

Equipments

The equipments to be grouped in this area will include the following for each preparation area. Meat preparation area If this area has to be an exclusive area, it should be well equipped with hardwood meat table, butcher's knife, electric saw and grinder sink storage trays, refrigerator facilities, knife, storage racks, and so on. So this activity could be properly carried out.

Vegetable preparation area

Vegetable preparation area are should be equipped with cutting boards, scrappers, Knives, peelers, storage facilities trays, scrappers etc.

Main cooking area (kitchen)

The main cooking area in a FSE is an enclosed space in which edible food materials are brought together combined and cooked in different ways for consumption.

Location

Location As far as possible, the kitchen should be adjacent to the storage area and nearby preparation area, pot and pan washing area and serving area. This area should be accessible to other work areas as the activities of other areas are dependent upon the activities to be performed in the main cooking area. Also either it can be

exclusive area with other areas located adjacent to this area or all other areas can be blocked out in the kitchen itself as shown here.

Space allocation

The size of the kitchen will vary according to the amount and nature of work to be done in it. A frequently quoted rule says that usually the space allotted to kitchen is approximately 1/3 to the % the total area of the dining room space, another rule says 2.5MX 3M is a sufficient for a single person to work in while 2.5m x 4m will provide comfortable working space for two persons. This ratio may be applicable only to a small FSE, while in large one's the size and shape of the spaces provided for main cooking area will be affected by

1. The size and type of the equipment's and their placement,
2. The amount of work space to be provided for a single person to work
3. Storage spaces to be provided whether duplication of each piece of equipment or few equipment's is required
4. Variety volume of production to be done in the space
5. Aisles to be provided and so on

Too large or too small a kitchen space to accommodate the necessary equipment's will lead to inefficiency in the use of the space and hinder work. hence space must be allocated in such a way so as to generate maximum production. It is a good practice to provide a compact arrangement of work tables and equipment's, so that unnecessary time and effort involved in extra walking, stretching and bending is avoided.

Equipment

Equipment's needed for this area will vary from institution to institution and hence its hard to specify 1 Or any food service. The type and number of equipment required will vary depending upon the variety of menu to be prepared and the volume of each item to be prepared in a given time. But a rough estimate says that it should include the equipment's like heavy duty burner, cooking range (optional) frying pan (kadai), electronic frying pan, griddle plate, mixing machines, grinders, steamers, toasters, idli steamer, pressure cookers, pots of different sizes, vessels, ladles, knives,

storage pots, trays, thandoori oven, beaters, sink, racks, cupboards, coffee maker, milk boiler, rice boiler, jugs, plates of varying sizes, steam- Jacketed kettles and other necessary equipment's that may be required. Its always advisable to arrange all equipment's along the four wall sides and if necessary one row in the center, so that this arrangement would permit minimum walking between 2 rows of equipment's. While in large kitchens an island arrangement of the cooking equipment near the Centre of the room is favored than over a wall setup, because of its relationship to preparation units, the shortened distance to the serving units and the sanitation factor. Of space and arrangement of equipment's to carry or the cooking activity as smoothly as possible.

Serving area

This area includes space in which prepared food is stored prior to service and also space eaten. This service area can be divided into 2 distinct Section one in which food is displayed and dished out for service.

Location

Serving or holding area and dining area as rule need to be located adjacent to each other as well as adjacent to cooking area and nearby dish washing area. But, under certain circumstances, however this may not be possible. For instant, when services need to be provided for patients in different floors or buildings (satellite pantry in each floor) or if services need to be provided in a-multi-stored office blocks or in a factory where workers need to be served in their places itself Under all these circumstances, serving and dining areas get separated from the cooking area and located at each distribution point. Thus the location of this area depends upon the serving policy of the establishment. The location of the serving area may be thus in the kitchen itself at various preparation centers where servers pickup their order for table service or it may be in the form of separate holding area in the kitchen at one corner or adjacent to the kitchen and dining or may be placed in each floor of a hospital in the form of satellite kitchen/ service pantry for may be a counter and so on. The space to be allotted for serving area will be influenced by the volume of food

to be hold at one time, nature of foods to be hold, type, size and number of equipments to be used, whether service is centralized etc. This area should be equipped with hot cases, bain-maries, refrigerators, food storage pots, trolleys hot food service trolleys, sink ladles, plates, lids, dustbins etc.

Dining area

This area should be placed adjacent to kitchen and holding area as well as in close proximity to that of dish washing area.

Space location

This is the only areca with which the customers come in direct contact in the entire layout, and hence may judge the standard of the establishment based on this area, hence, it is necessary that this area has to be planned carefully to create quiet, peaceful, comfortable and congenial atmosphere that are conductive to the enjoyment of good food and hospitality.

Space allocation

The space allocation for this area depends on various factors such as

1. Number of people to be served at a time
2. Aisles to be provided between rows of table arrangements.
3. Size of furniture to be used.
4. Style of service to be adopted.
5. Number and size boards to be used (as storage facility).
6. Number of persons to work inside the area.
7. Washing facilities to be provided.
8. Whether it requires any office space in the form of cash collection or not.

Ware washing

It includes the activity of cleaning all soiled items from various areas of the layout such as from main cooking area, from holding area and from dining area. Ware washing area can be one where soiled items from the 3 mentioned areas would

come for cleaning or it may be 2 separate cleaning areas namely-pot and pan washing area and dishwashing area.

Pot and pan washing area

This is the area where soiled pots, pans and other equipments from main cooking area and holding area cleaned. Being an independent area on its own, it has to be located adjacent out of main traffic lines as the noise created in this area should not hinder activities in other areas. Often it is located conveniently at the end or back of the cooking unit. It may sometimes also be located at one corner of the kitchen as in smaller food services

Space allocation

The space to be allocated will be influenced by a number of factors such as the number of pots and pans need to be cleaned at one time, storage facilities to be provided, whether trolleys are to be used or not, the type washing facility provided (whether manual or 2 or 3 compartment sinks or mechanical machines etc) number of people to work inside and so on.

Equipments

As pot and pan washing goes hand in hand with hygiene and sanitation principles, thorough cleaning has to be all the time emphasized. For this, this area should be equipped with 3 or 4 compartment sink with drain board, storage racks, trolleys, dustbins, scrubbers, brushers, if possible mechanical washers and sterilizing plant for the sterilization of equipments.

Dish washing area

As soiled items from the dining area are exclusively cleaned here, it has to be located adjacent to the dining area and also to serving area, so that from dining soiled items would go to dish washing, from there the cleaned ones to serving and from there back for service to dining area.

Space allocation

Same as that of pot washing area.

Equipments:

This area should have 3 or 4 compartment sink with hot water sterilization in the last compartment (as sterilization of dining room equipment is a must provide sterile items to guests) along with drain boards, storage facilities, trolleys for collection, scrubbers brushes, dustbins and racks. If possible, its better to equip this area with dishwashing machine, so that all activities like pre-washing, washing, rinsing and hot water sterilization could be done in one process in one piece of equipment. This is more economical as it reduces the number of persons required, speedy cleaning process and complete sterilization of items. It is the mechanical dishwasher.

FOOD WASTE AND TRASH/GARBAGE DISPOSAL AREA

One can have this activity being carried out within the premise itself, if so there has to be trash collection facility in every other activity area, and also a common place where trash from all activity area would be collected for disposal. (This common disposal areal should be located at the backside of the premise, away from other areas. It has to be totally an exclusive area.

EQUIPMENTS

Root -operated pedal bins or water-proof sealing type plastic bins can be used in each activity area for the collection of water. In the main disposal area, one can have incinerator in which most trash 1s burned, or central food waste compactors in which waste is compressed under heavy pressure to small volume. It one cannot afford these equipments, and if no such facility disposal area for frequent removal.

WORK SIMPLIFICATION/ WORKERS AND THEIR WORK SPACE NEEDS DEFINITION:

Work simplification implies applying simplest, easiest and quickest method to do a task. So it saves a time, labour, energy, effort, and to reduce strain.

Mundał classification

- Changes in body positions and motions
- Changes in tools and working arrangements
- Changes in production sequence
- Changes in finished product
- Changes in raw materials

Work can be simplified by viewing the kitchen and its activities from five different aspects.

a. Work area

b. Worker's area of reach

c. Work space

d. Equipment, materials and supplies

e. Movements at work

Work area:

This refers to the area of the work surface. Its height from the floor and the location of the equipment and materials to be used on the Work surface. It is recommended that for a worker performing a task in the standing position, the height of the work surface from the floor should be just below the waist-line, so that there is no need to bend at the waist or hip while performing the task.

If it the surface is too low, backache and general discomfort will result, and if too high it will cause undue muscular strain and fatigue.

When working in a seated position unnecessary stretching or straining of the neck muscles should be avoided. For comfort, feed should rest on the floor, so that an erect posture can be maintained.

Surface height should also be planned to vary with the nature of the activity. For example, a sink unit top should be higher than a food preparation surface to take into account the need for reaching down to the base of the sink in the former. Likewise gas stoves should be fixed at a lower level than the work surface so that when a cooking pan is placed on it, the contents can be seen and stirred without standing on one's toes. Considering that the worker may be performing tasks over long periods of time, badly planned work areas will probably result in mental irritability and accidents. Well planned work areas not only physical comfort, but also contribute to a sense of provide psychological and social well-being within the work environment.

Worker's area of reach

The body and reach characteristics of people directly influence the designing of areas. The area of the work surface is determined by the area of reach of the average worker.

The “area of reach” signifies the limits to which a person can stretch his or her hands to grasp materials and equipment, required for an activity. If the arms of a worker are fully extended outward to form a circle on the work surface, the area within the circle is termed as the area of 'normal reach'. A worker can reach any object in this area without stretching or moving other parts of the body. It is- the most comfortable area of work involving the least amount of energy, and providing the most effective view of materials and actions for a particular job.

Work space

The amount of space available for work is important for completing tasks efficiently. The space should be large enough to place all the materials and equipment required, as well as allow for movement at work. In addition extra space required for placing completed parts of the work kept aside till it is needed again. For example, in making a salad, a number of vegetables or fruits may be need to be cut and kept aside, away from the area of normal each which would be required for

the preparation of the salad dressing. Finally, all the parts of the salad would have to be put together before being served.

Insufficient work space will involve extra movements in trying to go elsewhere to put away the completed work and come back to the next activity.

Equipment, materials and supplies

Equipment, materials and supplies, all have to be considered in relation to the physical structure of the kitchen and the persons using them. Their placement, suitability, quality and quantity, all determine how simple any work can be made. This awareness help, to establish plans that are economical in terms of human effort, time and other valuable resources.

Any materials, equipments or supplies in regular are use should be placed within the maximum reach zone, because activity is concentrated in the zone of normal reach. Shelves may be located within these zones for items which are used occasionally. This helps to increase the space within the work area.

The normal and maximum reach zones are important in organizing work centres, if one remembers that reaching for an item by stretching upward is less strenuous than reaching outwards or downwards.

Movements at work

One needs to become conscious of how body movements are related to the amount of energy consumed. For this, it is necessary to understand that the body has been designed so that its weight is evenly distributed over the legs. When working in any position standing or seated, the centre of gravity of the body is disturbed. This causes unequal distribution of weight on the legs resulting in extra energy consumption to maintain the body position.

If the balance is continuously disturbed in any activity, muscles get tired, and fatigue sets in. in addition, the muscles of the body are so arranged that the large muscles occur at those points in the body which are meant to take up maximum

strain. With this. in mind, the largest muscles in the part of the body moved, should be brought into operation whenever an action is performed. This fact is realized. when we observe that some jobs are tiring for some people and not for others. This is because some people waste their energy because of wrong postures and therefore less energy is available for the job, which consequently does not get completed as best as possible and in the shortest possible time. Developing the art of muscle coordination to perform work with a tireless rhythm may require a conscious effort, but it is worthwhile making it till it becomes a habit the habit of "not getting tired" at work.