

HOUSING AND REARING SYSTEMS FOR CATTLE AND BUFFALOES (LPM-601)



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ANIMAL HOUSING

Objectives:

- To protect animals from inclement weather conditions like rain, hot, cold, sunburn etc.
- To provide clean and comfortable shelter to animals.
- To protect animals from theft and wild predators.
- Better care and supervision of animals and optimum utilization of labour.

Housing

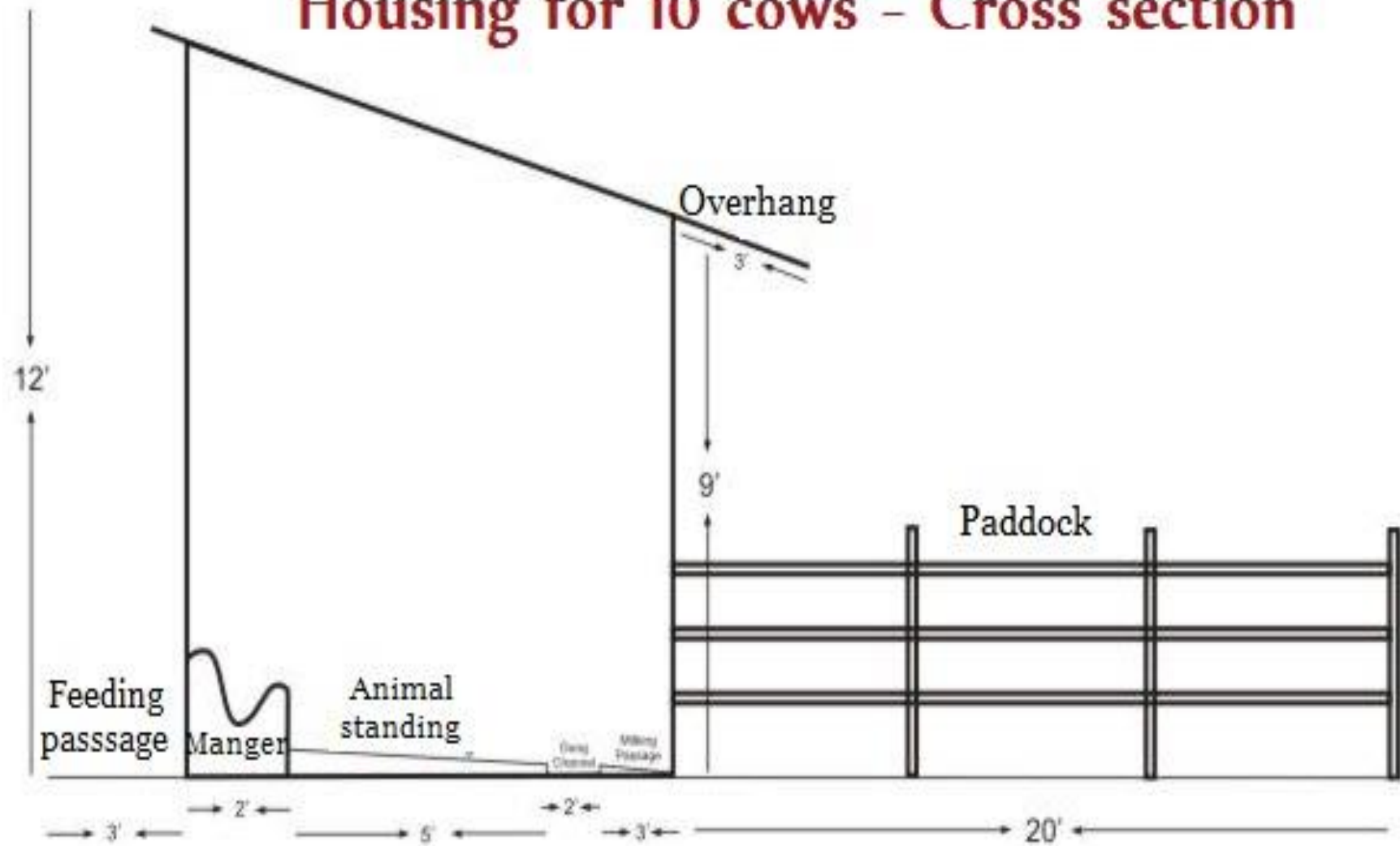
- To modify/alter micro-environment or to keep animal in thermo-neutral zone.
- Aim is to optimize animal's production by:
 - Protecting them from climatic stress,
 - Providing clean and comfortable shelter
 - Providing them proper feeding, watering and management.
- In Indian conditions, loose housing system is generally advocated barring some temperate high altitude area and in heavy rainfall areas.

Types of housing for Dairy cattle

Loose Housing

- A system of housing in which animals are kept loose in an open paddock in group of 40-50 throughout the day and night except at the time of milking and some other specific purposes like treatment, breeding etc.
- This housing system consists of continuous manger along with covered standing space, common water trough and open paddock which is surrounded by brick wall or fencing.
- A separate structure of calf pens, calving pens, milking byres, bull pens etc. are also required for housing of other categories of animal in this system.

Housing for 10 cows - Cross section



Advantages of loose housing system:

- Cost of construction is cheaper.
- Common feeding and watering arrangement is possible.
- Clean milk production is possible because the animals are milked in a separate milking barn.
- An animal remains free, therefore behavioural expression makes heat detection is easy and efficient.
- At least 10-15 percent more stock than standard can be accommodated for shorter period.

Disadvantages of loose housing system:

- It is not suitable for temperate Himalayan region and heavy rainfall areas.
- It requires 10-12% more floor space than conventional barn.
- There is competition for feed and water.
- Attention of individual animal is not possible.
- A separate milking barn is needed for milking of animals.

Conventional Barns/ Stanchion Barns/ Tie Barns

- In this system of housing, the animals are confined together on a platform and secured at neck by stanchions or neck chain.
- All the activities are done at same place.
- Animals are well protected from adverse climatic conditions.
- The animals are fed as well as milked in the same barn.
- These barns are completely covered with roofs and the sidewalls are closed with windows or ventilator located at suitable places to get more ventilation and lighting.
- It is more applicable for temperate and heavy rainfall region.



Advantages

- The animals and men caring for animals are less exposed to harsh environment.
- Intensive system of rearing.
- Better utilization of labour and time.
- The animals can be kept clean.
- Diseases are better controlled.
- Individual care can be given.
- Separate milking barn is not required.



Disadvantages

- Cost of construction is more.
- Future expansion is difficult.
- Not suitable for hot and humid climatic conditions.

Important Sheds

1. Cow/Buffalo sheds:

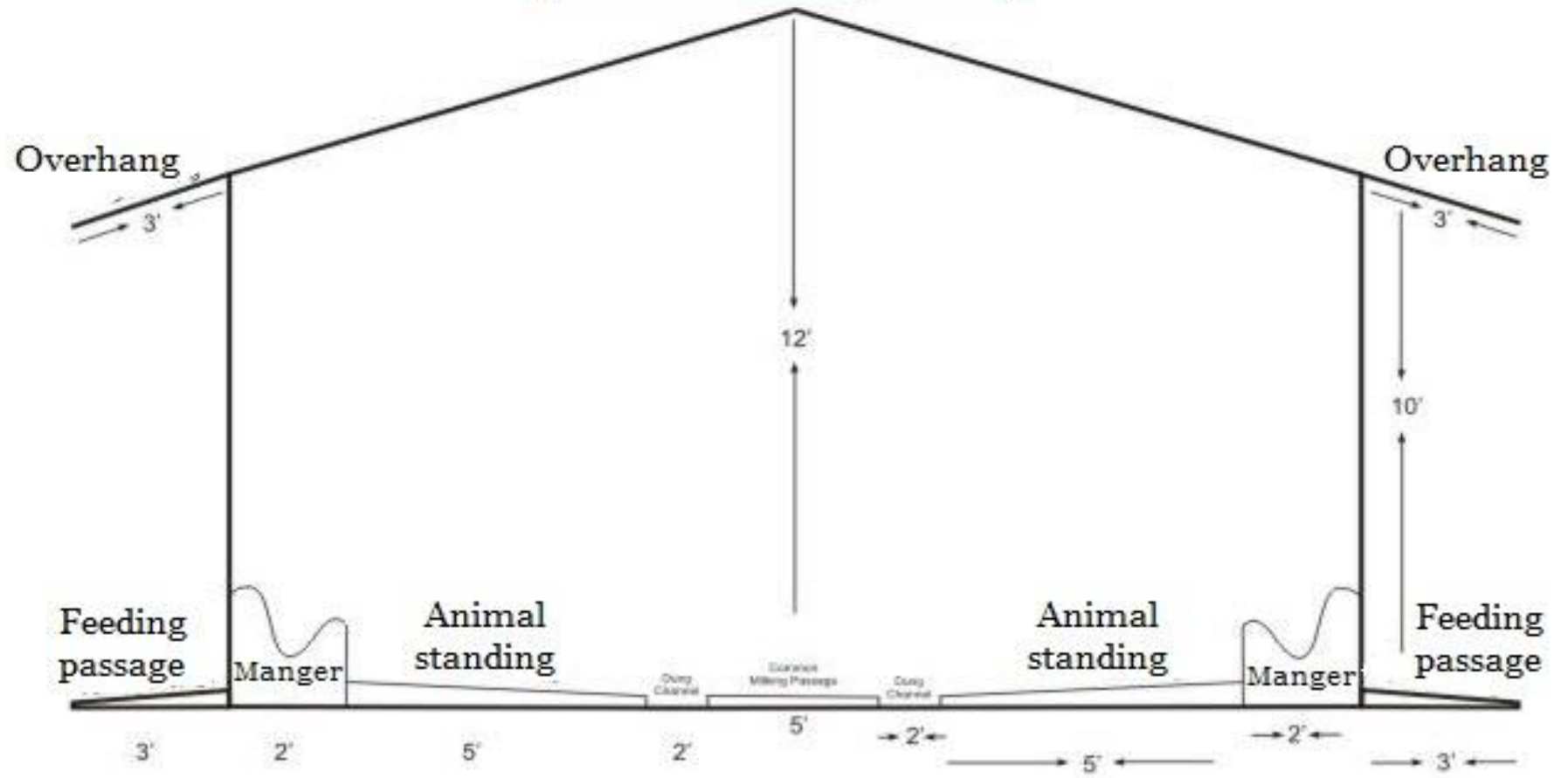
- If cattle/buffaloes number is less than 10, shed can be arranged in single row.
- If animals are more than 10 in number better to keep animals in double row.
- In double row system, animals can be arranged in either tail to tail system or head to head system.



Advantages of tail to tail system:

- Wide middle alley is of great advantage in cleaning and milking of animals.
- Diseases spread chances from animal to animal reduces.
- Cows can always get more fresh air from outside.
- Farmers can inspect a greater number of milkmen while milking.
- Any sort of minor disease or any change in the hind quarters of the animals can be detected quickly and even automatically.

Housing for 20 cows - Cross section (Tail to tail system)



Advantages of face to face system:

- Cows make a better showing for visitors when heads are together.
- Animal feels cosy.
- The cows feel easier to get into their stalls.
- Sun rays shine in the gutter where they are needed most.
- Feeding of cows is easier; both rows can be fed without back tracking.




2. Calving boxes:

- To check mortality and better observation and care, pregnant animals should be transferred to maternity pens two to three weeks before the expected date of calving.
- Dimension of covered area as well as open paddock must be 12 m² with ample soft bedding in covered area.
- In a dairy farm, number of calving boxes should be 10% of breedable female stock.



3. Isolation box:

- This shed should be located away from other sheds, so that inaccessible to other animals.
 - Every isolation box should be self-contained and should have separate connection to the drainage disposal system.
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4. Sheds for young stocks:

- Calves shed should be situated in such a place so that they can easily be taken to their dams at milking time i.e. nearer to milking barn.
- An overall covered space of:
 - 20-25 square feet per calf below the age of 3 months,
 - 25 -30 square feet per calf from the age of 3-6 months,
 - 30-40 square feet per calf from the age of 6-12 months
 - 40-45 square feet for every calf above one year, should be made available for the sheltering such climatic conditions.



5. Bull or bullock sheds:

- It should be constructed towards one end of the farm.
- For every 100 milch cows two bull sheds should be constructed for housing two bulls.
- A bull must be provided with 12 m² of covered area as well as 120 m² of open area, where animal can exercise and make themselves fit.

Ancillary structures at a Dairy farm

➤ Stores:

- To store hay, straw, concentrate feed and equipments, stores are constructed.
- It should be damp free and protected from rodents.
- Generally, provision of 0.2 m² storage space per adult unit would suffice for cattle and buffaloes.



Silos:

- Silage is prepared in silos by ensiling green fodder under anaerobic condition, so that can be used in scarce period.
- At large dairy farms various types of silo like tower, trench are used in Indian conditions.

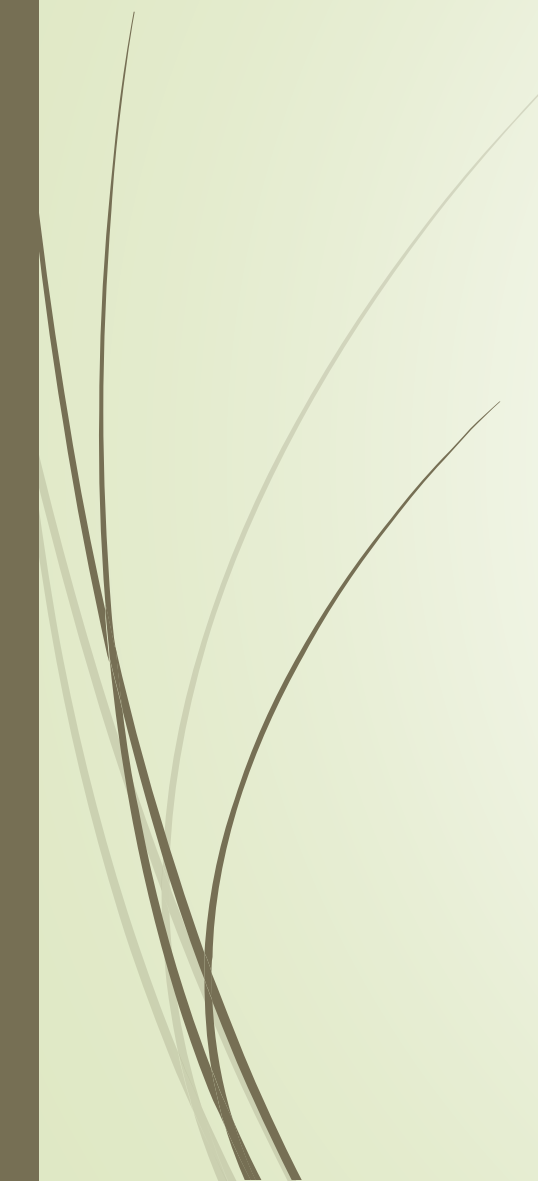
Milk House:

- It is the place where milk is collected, weighed and stored in cans for brief periods, before delivering to milk plants.



PLANNING AND PHASED CONSTRUCTIONS OF BUILDING AT DAIRY FARM

Objectives:

- Efficient management requires well-planned and adequate housing.
 - Housing should modify the micro-environment inside them by reducing climatic stress.
 - Better care and supervision of animals and optimum utilization of labour and time.
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Planning new farm buildings

Factors affecting site selection are:

- Topography
- Drainage
- Exposure to the sun and protection from wind
- Accessibility
- Water supply and electricity
- Labour
- Marketing

Arrangement of Farm Buildings

- **Location of farmers house:** At high area , well drained and easily accessible
- **Orientation:** Generally animal sheds are located with long axis East to West with the paddock facing the North; to get direct sunlight during winter, but some researchers also suggests having north-south orientation.
- Direction of winds
- Saving of time and labour
- **Fire protection:** Large buildings should be 25 metres apart.

Design Consideration for Animal Houses

- ▶ House must be designed to have following thing in mind:
 - ▶ **Reduce heat gain:** planting trees, reduce ground reflection by coverage of landscape, attached shade
 - ▶ **Promote heat loss from the animal house:** by radiation and conduction, cooling of exterior surface, minimising solar projection by suitable materials of roof, walls etc., adequate ceiling height and insulation.
 - ▶ **Reduction in heat liberation inside the building** by keeping animals in pens low.
 - ▶ **Animal shelter designs:** Proper ventilation

Floor Space Requirements for Cattle and Buffaloes

Type of animal	Floor space requirement (m ²)		Maximum no of animals / pen	Height of the shed (cm)
	Covered area	Open area		
Bulls	12.0	120.0	1	175 cm. in medium and heavy rain fall areas and 220 cm. in dry areas.
Cows	3.5	7.0	50	
Buffaloes	4.0	8.0	50	
Down calvers	12.0	12.0	1	
Young calves	1.0	2.0	30	
Old calves	2.0	4.0	30	

Feeding and watering space requirements:

Type of animal	Space per animal (cm)	Total manger length in a pen for 100 animals(cm)	Total water tank length in a pen for 100 animals (cm)
Adult cattle & buffaloes	60 – 75	6000 – 7500	600 – 750
Calves	40 – 50	4000 – 5000	400 – 500

Dimensions of feed manger:

Type of animal	Width (cm)	Depth (cm)	Height of inner wall (cm)
Adult cattle and buffaloes	60	40	50
Calves	40	15	20

Construction Details of Different Structures

Floors: Hard, impervious to water and easy to clean.


- Cement concrete or paved with cement concrete flooring tiles, brick on edge flooring, stone slab flooring or moorum or kankar flooring.
- The best and costliest floor are of cement concrete which is suitable for milking barns, stores, calf pens etc.
- The floors shall have a gradient of 1 in 40 to 1 in 60 towards the drains so that washed water can run into drains easily.

Walls: in Loose house walls are not so extensive. one and half metres high walls enclose the open area.



Roof: Strong, light, durable, weather proof, bad conductor of heat and free from tendency to condense moisture inside.

Two types of roof:

- **Sloping:** Preferred in medium to heavy rainfall areas.
 - **Flat:** Preferred in low rainfall area, dry areas.
 - Several materials are used for roofing depends on cost, number of animals and availability of materials. Ex. tiles, slates, galvanised iron sheets, corrugated asbestos, wood, thatch, bamboo etc.
 - The slope of roof is expressed as its pitch angle of slope with the horizontal. The pitch should be 35° for thatched roof, $25-30^{\circ}$ for a tiled roof and $12-18^{\circ}$ for a sheet roof.
 - The slope is generally steeper in heavy rainfall areas, but pitch should not exceed 45° at any rate.
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Drinking Water Provision

- ▶ Water at farm will be used for drinking and washing of animals, washing of floors, utensils, irrigation.
- ▶ According to season, food and physiological status of animals requirement may increase.
- ▶ Buffaloes require more water than cows. The water trough may be round or rectangular.
- ▶ The bottom of water receptacle and all angles and corners of the trough should be well rounded off.
- ▶ Have a slope to one side ending in a hole to allow easy draining and cleaning
- ▶ Daily water requirement of a dairy cow varies between 57-120 litres and 68-120 litres per day in Buffaloes.



THANKS