

2. HOUSING OF DAIRY ANIMALS

Do you know ?

1. Importance of cattle housing
2. Types of housings for animals
3. Different components of farm building



An efficient management of dairy animals will be incomplete without a well planned and adequate housing. Improper planning of animal housing may result in additional labour charges and discomfort to animals. During erection of farm building, care should be taken to provide comfortable accommodation for an individual animal. Proper sanitation, durability and arrangements for the production of clean milk under convenient and economic conditions are also to be taken care off. Although expenditure on housing is unproductive it is essential to have proper housing for providing proper comfort to animals and their protection from severe cold, rain, temperature and predators.

Do you know ?

Housing protects animals from sun, rain, wind, snowfall, predators and provides comfort to get maximum production.



2.1 Objectives of housing

1. To protect dairy animals from extreme climatic conditions.
2. To protect dairy animals from wild animals and theft.
3. To provide maximum comfort to dairy animals so as to get more milk yield.
4. To produce clean and hygienic milk.
5. To increase the efficiency of labour.

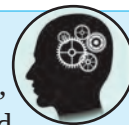
2.2 Selection of site

The points to be considered for the selection of site and layout of dairy farm are as follows -

1. **Topography and drainage** : A dairy building should be at higher elevation than the surrounding area to offer good slope for rain water and proper drainage of the dairy wastes. This helps to keep barn dry. Land should be leveled.
2. **Soil type** : Well drained high elevated poor to medium type of land should be selected for construction of dairy farm structures.

Remember...

Floor must be moisture proof, easy to clean non slippery and predator proof



3. **Exposure to the sun and protection from wind** : Building should be planned in such a way that direct sunlight can reach the platforms, gutters and mangers in the shed so as to dry it at early.

Remember...

The long axis of the dairy barns should be set in the north-south direction to have maximum benefit of sunlight and ventilation.



4. **Accessibility** : Easy accessibility to main road preferably at a distance of about 100 meters is always desirable for a dairy farm. Dairy building should not be too close to road to avoid the disturbances.
5. **Durability** : Durability of the structure is an important aspect for building a dairy farm.

This will reduce the cost of maintenance and repairs to building.

6. **Water supply** : Supply of Sufficient fresh, clean and soft water should be made available. To avoid environmental dust and dirt, water tank should be covered. White wash should be given to tank weekly to keep water clean.
7. **Surroundings** : Areas nearby the dairy farm should be away from wild animals and marshy land. Fencing should be provided to dairy farm. Tree plantation should be done around the dairy farm.
8. **Labour** : Regular supply of honest, economic and skilled labour should be available for day to day work at farm.
9. **Marketing** : Dairy farm should be located in the areas from where the market place is nearer so that transportation cost is less and spoilage of milk can be avoided. This helps owner to sell dairy products profitably and regularly. He should be in a position to satisfy the needs of the farm within no time and at reasonable cost.
10. **Electricity** : Since a modern dairy always handles most of the electric equipments, it is desirable to have an adequate and regular supply of electricity.
11. **Facilities for feed storage** : Dairy farms should be constructed and designed in relation to feed storages, hay stacks, silo and manure pits.

Do you know ?

Sufficient space per cow and well arranged feeding mangers contribute not only to higher milk yield of cows but also to make the work of the operator easier and minimize feed expenses.



2.3 Systems of housing

The most widely prevalent practice of housing animals in India is to tie the cows with rope on a kaccha floor, thus they are exposed to extreme weather conditions leading to health problems and lower production except some organized dairy farms where proper housing facilities exist.

Dairy cattle may be successfully housed under a wide variety of conditions, ranging from close confinement to little restrictions except at milking time. At present following two types of dairy housings are in general uses -

1. Loose housing system
2. Conventional housing system

2.3.1. Loose housing system

1. In this system animals are kept loose in an open paddock except at milking time and treatment.
2. A covered shed is provided for shelter at one end of the paddock.
3. There is separate milking parlour where milking of animals is done.

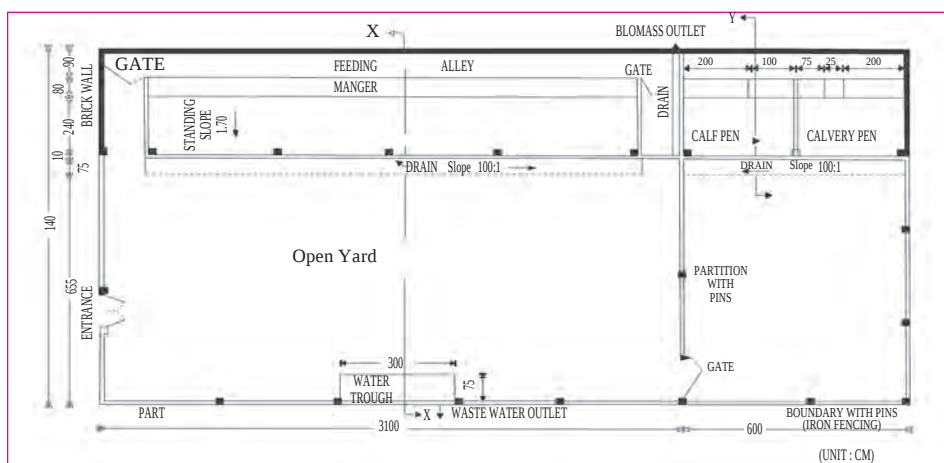


Fig. 2.1 : Layout of loose house for 40 dairy animals

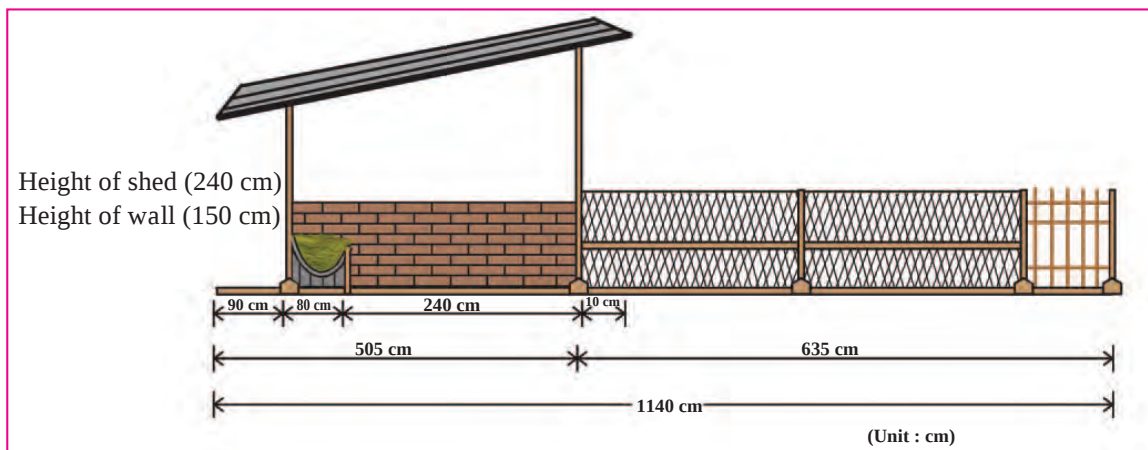


Fig. 2.2 : Sectional view of loose house

4. Feed and fodder is offered in a common manger.
5. A common water tank is provided at one side of byre for providing water to animals.
6. Total area is protected by compound wall.
7. Bedded area of about 60 sq. ft. /cow is provided to give comfort to cows.



Fig. 2.3 : Loose housing system with tin shed



Fig. 2.4 : Loose housing under tree

The floor space requirements for different categories of dairy animals are given in Table 2.1.

Table 2.1: Floor space requirement (per animal) for different categories of dairy animals

Sr. No.	Category	Covered area (sq.ft.)	Open paddock (sq.ft.)
1.	Calves (0-3months)	10.66	10.66 - 16.14
2.	Calves (3-6 months)	10.66-21.53	21.53 – 26.91
3.	Calves (6-12 months)	21.53	37.67 - 43.05
4.	Cows	37.67	75.35
5.	Buffaloes	43.05	86.11
6.	Breeding bulls	129.17	1291.71

The feeding and watering space requirements for dairy animals are given in the Table 2.2

Table 2.2 : Feeding and watering space requirements (per animal) for dairy animals

Category	Length of manger / water trough (feet)	Width (feet)	Depth (feet)	Height of the inner wall (feet)
Adult cattle and buffaloes	1.97 to 2.46	1.97	1.31	1.64
Calves	1.31 to 1.64	1.31	0.49	0.66

Advantages

1. Cost of construction is low.
2. Animal get free choice of green or dry fodder and water.
3. Heat detection in females is easier.
4. Animals feel comfortable and stress free as they are free to move.
5. Feeding and management is easier.
6. Sick animal can be easily identified
7. Labour requirement is less.
8. It is possible to expand the housing without much modification, and cost.
9. It is most suited in tropical climate.
10. It helps in clean milk production as cows are milked in milking parlour.
11. Animals also get sufficient exercise which is extremely important for better health and production.

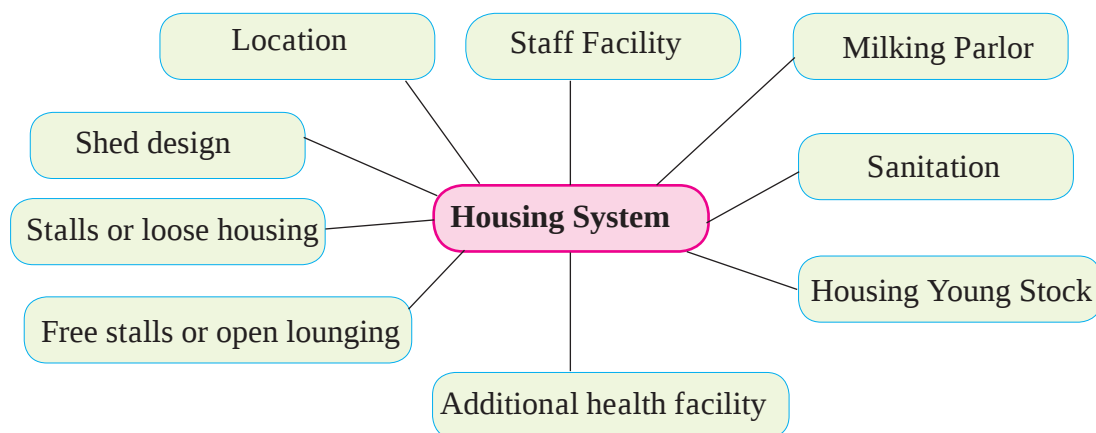


Fig. 2.5 : Points to be considered to develop housing systems for dairy farm

12. Incidence of mastitis has been recorded less in loose housing systems.
13. Injuries to the joints, feet and udder are found to be less.

Disadvantages

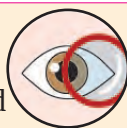
1. Total floor space required is more as compared to conventional housing system.
2. Spread of contagious diseases is likely to be more.
3. Females in heat may disturb other animals in the herd.
4. Display of animals in herd is not proper.
5. It is not suitable in heavy rainfall and temperate climate.
6. There are chances of fighting between the animals as there may be a competition for feed and fodder among them.
7. Individual animal attention is not possible



Fig. 2.6 : A cheap wooden fencing loose housing

Observe and discuss...

Visit nearby cattle farm and note down difference between loose and barn housing system



Internet my friend

Loose housing system is old method but now a days this method is used for milch animal



2.3.2 : Conventional housing system

The conventional housing systems is becoming less popular day by day as it is comparatively costly. However, by this system cattle are more protected from adverse climatic condition.

It is mainly of two types i.e. 1. Tail to tail and 2. Head to head system.

1. Tail to tail housing system : In this system of housing animals are arranged in a head out manner and there is a common passage between two rows called central or litter alley.

Advantages

1. Milking, collection of milk and its supervision is convenient due to central alley.
2. Collection of dung and cleaning of shed is easier due to central alley.
3. Heat detection and AI is easier.

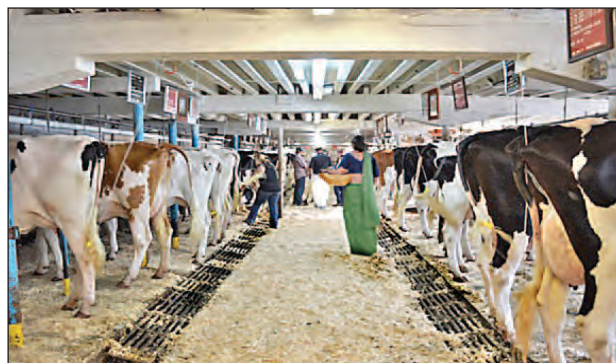


Fig. 2.7: A view of tail to tail housing system

4. Spread of contagious diseases is less.
5. Animals are not disturbed by each other as all are facing out.
6. It is convenient for machine milking.
7. Animals get optimum ventilation.
8. Mechanization is easier.

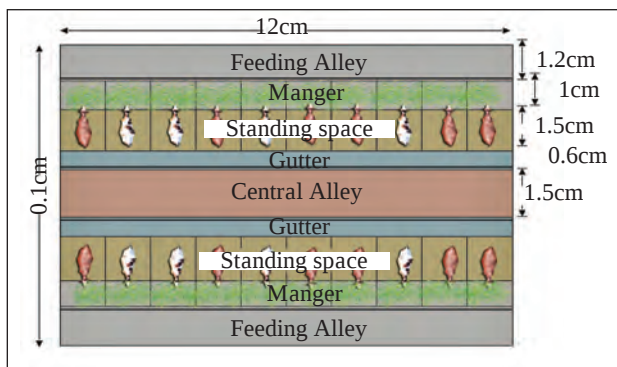


Fig. 2.8 : Layout of tail to tail housing system for 10 dairy animals

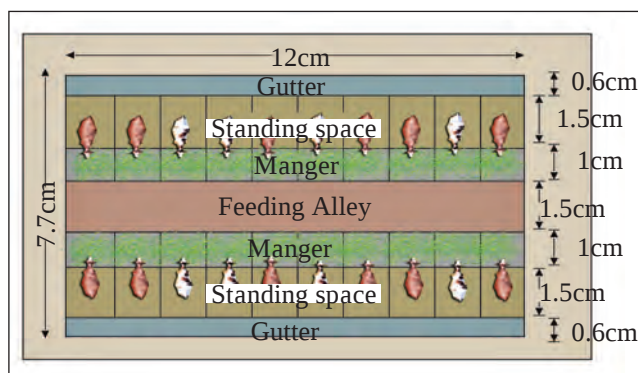


Fig. 2.9 : Layout of head to head housing system for 10 dairy animals

- Supervision at the time of milking is easier for both the rows

Disadvantages

- It requires more time for feeding.
- It gives bad display to visitors.
- Gutter remains moist as sun rays does not reach to it.
- Entrance of animals is difficult.

Do you know ?

The Tail to tail housing system of animal is considered better than head to head housing system



Can you tell ?

Why tail to tail system is most suitable for cattle farming?



Fig. 2.10 : A view of head to head housing system

Disadvantages

- Milking, collection of milk and its supervision is inconvenient.
- Detection of heat and gynaeco-clinical problems is difficult.
- While milking, animals may get disturbed by other animals facing to them.
- Time required for cleaning of shed is more.

2. Head to head housing system

In this housing system animals are arranged in a head to head manner and there is common feeding passage at centre between two rows.

Advantages

- It requires less time for feeding.
- Gutters dry quicker as they are facing out hence more exposed to sunlight.
- It gives better display of animals to the visitor.
- The chances of spread of diseases are minimum.
- Entry of animals is easier.

Internet my friend

Visit nearby Tail to tail and Head to head housing system and find out difference between them.



Table 2.3 : Difference between Tail to tail and Head to head housing system

Sr.No.	Tail to tail housing system	Head to head housing system
1	In this system of housing animals are arranged in a head out manner and there is a common passage between two rows called central alley	In this housing system animals are arranged in a head to head manner and there is common feeding passage at centre between two rows.
2	It gives bad display to visitor.	It gives better display to visitor.
3	It requires more time for feeding.	It requires less time for feeding.
4	Milking, collection of milk and its supervision is convenient	Milking, collection of milk and its supervision is not convenient
5	Heat detection and AI is easier.	Heat detection and AI is difficult.
6	Gutter remains moist as sun light does not reach to it.	Gutters dry quicker as they are more exposed to sunlight.
7	Entrance of animals is difficult.	Entry of animals is easier.
8	Animals are not disturbed by each other as all are facing out.	Animals are disturbed by each other as all are facing out.
9	Mechanization is easier.	Mechanization is difficult.
10	The chances of spread of contagious diseases are less	The chances of spread of diseases are minimum.
11	Animals get maximum ventilation.	Animals get optimum ventilation.

Table 2.4 : Difference between Loose housing system and Conventional housing system

Sr.no.	Loose housing system	Conventional housing system
1	In this system animals are kept loose in an open paddock except at milking time and treatment.	In this system animals are kept in the well protected shed
2	Cost of construction is low.	Cost of construction is high.
3	Heat detection in females is easier.	Heat detection in females is not so easier.
4	Feed and fodder is offered in a common manger.	Feed and fodder is offered in a separate manger.
5	Animals also get sufficient exercise which is extremely important for better health and production.	Animals does not get sufficient exercise which is extremely important for better health production.
6	It is possible to expand the housing without much modification and cost.	It is not possible to expand the housing without much modification and cost.
7	Animals feel comfortable and stress free as they are free to move.	Animals does not feel comfortable and stress free
8	Sick animal can be easily identified	Sick animal can't be easily identified

9	Incidence of mastitis is less in loose housing systems	Incidence of mastitis is more in conventional housing systems
10	Injuries to the joints, feet and udder are found to be less.	Injuries to the joints, feet and udder are found to be more.
11	Animal get free choice of green or dry fodder and water.	Animal does not get free choice of green or dry fodder and water.
12	Spread of contagious diseases is more likely to occur.	Spread of contagious diseases is less likely to occur.
13	Display of animals in herd is not proper.	Display of animals in herd is proper.
14	Individual animal attention is not possible	Individual animal attention is possible

2.4 Components of the animal house

The main components of farm building are floor, roof, manger, alley, gutters, doors, water trough and walls.

1. Floor

- It should be made from impervious material, easy to clean and should remain dry.
- It should be even but non slippery.
- A slope of 3 cm should be provided from manger towards the gutter.
- Floor space required per cow is about 1.5 x 1.2 m.

Cement concrete flooring with grooves or paved with bricks is preferred.



Fig. 2.11 : Murum floor with soft bedding loose housing



Fig. 2.12 : Brick floor of the conventional housing (Tail to Tail)

2. Roof

- Roofing material used are should be coated iron sheet, asbestos sheet, cement sheet or thatched roof.
- Corrugated iron sheet becomes hot in summer and cold in winter. Hence, it brings about extreme fluctuations in the temperature inside the shed. Roof should preferably be made up of asbestos sheet
- Height of roof should be 2.4 m at the sides and 4.5 m at the centre to permit sufficient fresh air and ventilation inside the house.
- Roof should be extended beyond wall by 0.75 m.
- Ventilation ridge (0.2 m wide and 0.2 m above) should be provided in the centre.



Fig. 2.13 : Tin shed



Fig. 2.14 : Green net shed

3. Manger

- Width of the manger should be 1.0 m.
- Height of rear wall of the manger should be 0.8 m and that of front wall should be 0.2 m (low front manger) to 0.4 m (high front manger).



Fig. 2.15 : Cheaper manger/feeding trough

- Low front type of manger is comfortable however high front type manger minimizes feed wastages.
- Slight slope should be provided to manger for cleaning purpose.



Fig. 2.16 : Common manger for feeding and watering

4. Alleys

- In tail to tail system the width of central or litter alley and feed alley should be 1.5m and 1.2m, respectively.
- Central or litter alley should have 2.5 cm slope from the centre towards gutters running parallel.
- In head to head system, the central alley or feed alley should have 1.5 m width.

5. Gutters

- Gutters is useful to collect and carry dung and urine of animals in the shed.
- Width and depth of the gutters should be 0.6 m and 0.2 m, respectively.
- Gutter should have 2.5 cm slope for every 3.3 m length.

6. Water troughs

- A water trough is simply a water container that holds water without affecting its quality, used for watering the livestock in shed.
- Various sizes water troughs are constructed or fitted in the centre or corner of animal sheds for drinking the water.
- These are may be of cement constructed/ fiber troughs / non-rusting metals.

- Now a day's automatic water troughs are available where troughs are get filled automatic.
- The capacity of the trough depends on the herd size of animals.



Fig. 2.17: Water troughs



Fig. 2.18 : Modern automated water trough

7. Doors

- Height of door should be 2.1 m.
- Width of the door for single row shed should be 1.5 m while for double row it should be 2.5 m.
- Doors should be fixed with wall by long hinges so that they should lie flat against external wall when full open.

8. Walls

- The width and height of wall should be 0.3 m and 1.5 m, respectively.
- The open space of 0.9 m should be kept between wall and roof except door side.
- The inner side of the wall should be smooth.
- White wash should be given to wall.



Fig. 2.19 : Iron pipe fencing for loose housing

9. Calving boxes

- Allowing cows to calve in the cowshed is highly undesirable as it leads to unsanitary condition for milk production and spread of disease is more.



Fig. 2.20 : Calving box

- Hence, special calving pen accommodation in the form of loose-boxes enclosed from all sides with a door should be provided to all parturient cows.
- It should have an area of about 100 to 150 sq.ft.
- It should have soft bedding with sufficient ventilation.

10. Isolation Boxes

- Animals suffering from infectious disease must be separated from healthy animals.
- For this loose boxes of about 150 sq.ft are to be provided.
- They should be situated at some distance from the farm.
- Every isolation box should be self contained and should have separate connection to the drainage disposal system.

11. Sheds for young stocks

- Calves should never be accommodated with adults in the cow shed.
- The calf house must have provision for daylight ventilation and proper drainage.
- Damp and ill-drained floors cause respiratory trouble to calves.
- It is useful to classify the calves below one year into three age groups, viz. calves below 3 months, 3-6 months and 6 months to 1 year for a better allocation of the resting area.
- Each group should be sheltered in a separate calf house or calf shed.
- As far as possible the shed for the young



Fig. 2.21 : Separate calf shed

calves should be quite close to the cow shed.

- Each calf shed should have an open paddock or exercise yard.
- An area of 100 square feet per head for a stock of 10 calves and an increase of 50 square feet for every additional calf will make a good paddock.
- An overall covered space of:
 1. 20-25 square feet per calf below the age of 3 months,
 2. 25 -30 square feet per calf of 3-6 months,
 3. 30-40 square feet per calf of 6-12 months and above, and
 4. 40-45 square feet for every animal above one year, should be made available
 5. Water troughs inside each calf shed and exercise ward should be provided.

12. Bull or bullock shed

- A separate accommodation for bulls or bullocks should be provided.
- A bull should never be kept in confinement particularly on hard floors. Such a confinement without adequate exercise leads to overgrowth of the hoofs creating difficulty in mounting and loss in the breeding power of the bull.
- A loose box with rough cement concrete floor with sufficient light and ventilation
- The shed should have a manger and a water trough.
- If possible, the arrangement of water and feed be served without entering the bull house.



Fig. 2.22 : Bull shed

Q.1. Fill in the blanks

1. A slope of cm should be provided from manger towards the gutter.
2. front type manger minimizes feed wastages.
3. The floor space required per cow is..... Square feet
4. In loose housing system length of the manger for adult cattle should be..... feet.
5. In housing system animals are arranged in head to head manner.
6. Height of roof at centre should be feet.

Q.2. State True or False

1. Milker is the first man who handles the milk.
2. The long axis of dairy farm building should be constructed in east west direction.
3. Manger is meant to collect and carry dung and urine of animals in shed.
4. In loose housing system, animals are kept loose in open paddock except at milking time
5. In tail to tail housing system animals are arranged in head out manner
6. In head to head housing system supervision of milking is difficult

Q. 3. Make the Pairs**Group A**

1. Manger
2. Gutter
3. Central alley
4. Roof

Group B

- a. Shelter
- b. Cleaning
- c. Carry dung and urine
- d. Feeding

**Q. 4. Answer the following questions in short.**

1. Mention the types of conventional housing system.
2. Write the meaning of loose housing system.
3. Give the covered area to be provided to an adult cow in loose housing system.
4. Name the housing system in which animals in heat can be detected easily.
5. Give the name of the housing system in which disease control of animals is better.
6. Which are the components of dairy farm buildings?
7. Write the objectives of housing.

Q. 5 Answer the following questions in brief.

1. Difference between loose and barn housing system
2. State points to be considered while selection of site for construction of dairy farm.
3. Give advantages and disadvantages of tail to tail system.
4. Give advantages and disadvantages of head to head system.
5. Explain in brief loose housing system for dairy animals.
6. Difference between Tail to tail and Head to head housing system