
UNIT 2 HOUSING SYSTEMS

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2.0 OBJECTIVES

After studying this unit, you will be able to:

- compare different types of housing poultry;
- recognize different poultry house designs; and
- judge the design of houses for other poultry species.

2.1 INTRODUCTION

In the previous unit, you have learnt about the principles of housing poultry and the pre-requisites of a poultry house. There are different types of housing systems in the rearing of poultry viz. extensive, semi-intensive, intensive and alternate systems. Each system of housing has its own advantages and disadvantages. This unit helps you to recognize different types of housing and house designs for different types of poultry. The housing designs for extensive and intensive system of rearing and for rearing of other poultry species like ducks, quails and turkeys are also discussed in this unit.

2.2 TYPES OF HOUSING

The poultry can be housed in many ways. You may wonder how the birds were reared before commercialization of poultry industry. You are perfect in your doubts.

In earlier days, chicken were primarily reared outdoor at the backyard. They used to be grazing in the morning hours and by the evening they return home to be kept under a bamboo basket with some water and left-over food or grains. You might have come across such poultry units even now in some villages. Hardly, any expense is involved in the rearing of birds. Under emergency, they can be easily sold. Therefore, they are even now referred to as “**Farmer’s Insurance**”.

But as the scientists improved the efficiency of the birds to produce eggs and meat, the needs of the birds also differed. After all, they cannot produce extra without anything extra. You imagine, if you are not provided with books, facilities, teacher etc. whether you can perform in the exams? Certainly not; isn’t it so? Exactly the same way, as the ability of the birds improved, their requirements also increased.

One of the most important requirements which went on changing with the improvements over the years is housing. Each of the systems has its own advantages and disadvantages. It is left to the farmer to decide upon which type of housing he or she wants. Types of housing systems are as follows:

2.2.1 Extensive System

This is same as explained above; the birds are left free outside and provided house or shelter only during night. No specific housing, equipment, feeding and for that matter, disease control measures are followed (Fig. 2.1). Many local (*Desi*) birds are being reared in our country in this way. Most of these birds are reared as a hobby and whatever is obtained from them is taken as bonus. In each unit, the number of birds reared will be limited to a maximum of 10 to 15.



Fig. 2.1: Extensive system of rearing turkey

(i) Advantages

- No need of a separate house for the birds.
- No need of looking after their feed and water because they graze and eat outside.
- Cost on feeding is virtually negligible since only left-over feed or grains will be given to the birds.
- As the birds are exposed to sunshine, they can produce their own Vitamin D.

(ii) Disadvantages

- Birds are likely to be eaten away by predators like dogs, eagles etc.
- There can be losses due to theft.

- They are exposed to all diseases; some of them can spread to humans also. You may be aware of bird flu outbreaks in Maharashtra, Assam, Sikkim, West Bengal and Tripura. You might have read in papers, lakhs of birds were killed to control the spread of disease to the nearby villages.
- More likely to have parasites both inside (endo-parasite) and on the body (ecto-parasite).
- They may not get proper food.
- Due to above factors, they produce very few eggs; say about 50 to 60 in a year.
- They weigh very less; about 1.0 to 1.2 kg when they are sold after 18 months of age.

2.2.2 Semi-extensive System

It is also called semi-intensive system. This system consists of a separate shelter for the birds during the night in which water and some feed is provided (Fig. 2.2). Litter material is spread on the floor. This shelter will be fenced all round giving sufficient area for the birds to graze during the day. Obviously, area available for grazing depends on the land covered by the fence. However, this system is popular for rearing turkeys and ducks than chicken. In case of ducks, a pond for them to swim may also be provided. Shelter is constructed similar to a deep litter house which you have learnt in the previous unit.



Fig. 2.2: Semi-intensive system of housing

(i) Advantages

- Birds are given some care at least during the night.
- Even during the day, due to fencing, chances of theft are also minimized.
- Fencing also limits predator attacks and diseases.
- As the birds are exposed to sunshine, they can produce their own Vitamin D.

(ii) Disadvantages

- Requires more land.
- Though reduced, predators are not totally restricted.
- Losses due to theft also are not eliminated due to fencing alone.
- Unless specific vaccination program is followed, the birds are also exposed to diseases. They are also more likely to have parasites both inside and on the body.

- They may not get proper food, because only during night, some feed is given which need not be a standard one.
- They also produce very few eggs; say about 50 to 60 in a year.
- They weigh less.

2.2.3 Intensive System

Due to improvements in the ability of birds to grow and produce, extensive and semi-extensive systems are not commercially practiced in our country. The word “Intensive” means more concentrated or more numbers per unit area or more intensity. Therefore, in all the systems under this category, more birds can be reared in a given area than in semi-extensive or extensive systems. There will be no area given outside the house. That means they are restricted into a house where they are provided with food, water and all other requirements. Therefore, intensive system can also be called ‘in-house system’. Since the birds are kept in-door always, they need to be provided with vitamin D through feed or water.



Fig. 2.3: Deep litter system

Deep litter, cage, all slat and litter are the intensive systems of rearing chicken. Of these, in India, deep litter and cage systems are more popular. Therefore, these two systems will be discussed in details while the others will be discussed in brief.

(i) Deep litter system

In this system, birds are left free on the floor (Fig. 2.3). To avoid cleaning of the floor every day, material which can absorb moisture is spread on the floor before leaving the birds on it. The material which is spread to absorb moisture is called as “Litter material”. Therefore, litter material with faeces produced by the birds accumulates and bacteria in such material decompose and form very good manure. Since the litter becomes deeper day by day, the system is referred to as “Deep litter system”. Birds do scratch and peck in the litter and even get certain vitamins and unknown growth factors while doing so! Most of the broilers in India are being reared under this system.

Now, you may raise a question, what are the characteristics of a good litter material and which are the popular ones used?

(a) Characteristics of good litter material

A good litter material should:

- be light in weight;
- be fairly coarse to prevent caking;

- be highly absorbent;
- dry rapidly by releasing absorbed moisture into the incoming air;
- be soft and compressible;
- be cheap;
- form part of the manure; and
- be easily available during all times of the year.

(b) Commonly used litter material

Paddy straw, ground nut shells, wood shavings, maize cobs, maize straw etc. can be used as litter material and paddy straw is by far the most commonly employed one.

Now, you will be interested to know what are the advantages and disadvantages of this system of rearing poultry.

(c) Advantages

- Deep-litter keeps cool during summer and warm during winter. Hence, the birds will be comfortable during all seasons.
- They can move freely, also adds to their comfort.
- Birds derive certain un-identified growth factors.
- There will be no incidence of swellings or damaged breast region in case of broilers.
- Usually, there will be no problem of ammonia accumulation and house-flies in a well-managed deep-litter flock.
- Incidence of broken eggs is very minimal.
- There will be no problem of caged layer fatigue.
- There will be uniform distribution of light in the layer house.
- Initial investment is less when the land cost is low.
- Welfare requirements of the birds are taken care of.

(d) Disadvantages

- Less number of birds can be housed in the same space than in cage system. That means more land is required than in cage system.
- Building dimension will be higher than cage system. Therefore, cost of construction of building increases. Remember, you have studied this aspect in Unit 1.
- There will be more feed wastage due to spilling from feeding trough.
- Birds consume more feed since they move about more freely wasting some energy.
- Litter-borne diseases (diseases that come only from litter) can occur, especially coccidiosis.
- Diseases spread faster due to free movement.

- Cannibalism (pecking and eating), if starts, will be severe when compared to cage system. Similarly, feather-pulling, picking and other vices (bad habits) are possible.
- More number of unclean or dirty eggs is likely.
- Birds consume more feed per dozen eggs.
- Broodiness (sitting on eggs to hatch) can be a problem.
- Nests have to be provided and the eggs have to be collected regularly.
- There is a chance of egg-eating vice, especially when the eggs are left in nest boxes or on floor for a long time.
- Fighting among birds especially cocks is possible.
- Requires more labour than cage system.

(ii) Cage system

Increase in cost of land and availability and wages of labour has made litter system costly. Therefore, an alternate system in which birds are totally restricted to meshwork compartments (cages) was introduced (Fig. 2.4). This saves the cost of litter material, reduces labour requirement and building cost. Most of the layers are grown in cages all over the world.

Cages suitable for all age and types of chicken are available. But, in our country, cages are popularly used for layers, whereas, others are generally reared on deep litter. Even in cages for layers, 3- bird cages are more popular than 1, 2, 4, 15 or 30-bird cages. Cages housing 15 or 30 hens are popularly called “Community or Colony cages”.



Fig. 2.4: Cage system

(a) Advantages

- This system can accommodate more number of birds in a given space than any other system.
- Movement of birds is restricted and hence they consume less feed when compared to other systems.
- There will be less wastage of feed because movement is restricted.

- No problem of litter-borne diseases, especially coccidiosis.
- Spread of disease is slower than other systems.
- Incidence of cannibalism is minimum.
- Birds lay more and heavier eggs.
- Consume less feed per dozen eggs produced.
- Eggs will be cleaner than in other systems.
- Broodiness is avoided.
- Labour requirement is minimum.

(b) Disadvantages

- Birds are uncomfortable because they are not able to move freely.
- Birds suffer from boredom. It is common to fix a coloured plastic wheel in all cages so that the birds can peck at them and play; but it cannot substitute for free movement and association between birds.
- During summer, birds are most uncomfortable due to high temperature. If humidity also is high as is expected at coastal places, birds feel very uncomfortable.

(iii) All-Slat system

You can notice that most of the advantages of cage system were due to the fact that birds do not come in contact with litter or faecal material. Similarly, you can also notice that number of disadvantages in cage system were due to restriction of bird's movement within the cage. Hence, a system in which the birds are reared on raised floor (made of mesh work) allowing faecal matter to collect in a pit underneath was developed. This system is called "Slat system of housing".

Slats can be made of wire or wood or high-impact plastic or any other strong material. They must be 2.50 to 5.00 cm wide and 2.50 cm apart running lengthwise of the building. They are fixed at 68 cm (2¼ ft) above the floor to allow collection of manure over a period of one year for which the birds are grown. The slats should be strong enough not to sag due to weight of the birds and their own. In general, this system is a combination of most of the advantages of both deep-litter system and cage system.

(a) Advantages

- Floor space required is approximately midway between deep-litter and cage systems.
- Coccidiosis can be avoided.
- Usually, there will be no problem of ammonia accumulation and house-flies in a well-managed all-slat flock.
- Number of broken eggs is very minimal.
- There will be no problem of caged layer fatigue.
- There will be uniform distribution of light in the layer house.

(b) Disadvantages

- Costlier than deep-litter system.
- Breast blisters may increase especially when slats are made of wire.
- Feed must be accurately balanced since the birds do not get unidentified nutrients from the litter.
- Initial investment is higher than deep-litter system.

(iv) Slat and litter system

This system is a combination of all-slat and deep litter systems. This is especially useful for breeding birds because increased fertility is noticed in this system.

The floor of the house will have deep-litter either at the centre or on the sides parallel to the length of the building. Obviously, slats will be laid in areas where deep litter is not present. Most of the feeders and drinkers will be on the slat area and the nests in the deep litter area.

You might wonder as to why this arrangement? The reason is that most often, birds pass faecal material either while eating or while drinking. If slats are provided, most of the faecal matter collects in pits and cleaning is easy. Generally, for commercial broilers and layers, this system is not followed.

2.2.4 Alternate Systems

In advanced countries, people have expressed worry about welfare of birds grown in cages. They are so particular that they purchase eggs produced by the birds *not housed in cages!* They are prepared to pay more money for eggs laid by birds left free (like extensive system). Hence, in some of the advance countries, birds are reared in specialized systems called barns, aviary or free range with good feed and disease control. Here, bird’s comfort is the main criterion and their production can be less than that in intensive systems. Such systems are not practiced in our country yet.

Check Your Progress 1

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

1) What do you understand by “Intensive system” and “Deep litter”?

.....

2) What are the characters to be looked for in a good litter material?

.....

3) List the advantages of cage system.

.....

Activity 1

Visit a nearby poultry farm and note down the system of rearing practised for different types of poultry. Give your opinion on the advantages and disadvantages of the system of rearing practised in the farm you visited.

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2.3 DIFFERENT POULTRY HOUSE DESIGNS

You already know that broilers and layers are reared in different types of houses. Broilers are grown in broiler house (a deep litter house), whereas, layers are grown in brood-grow house (BGH) at the beginning followed by cage layer house (CLH) till the end of lay. In this section, you will recognize house designs for semi-extensive and intensive systems of housing poultry.

2.3.1 Semi-extensive System

This system of housing is commonly practised for rearing turkeys and ducks. The dimensions of the shelter and enclosure depend on type, age and number of birds to be housed. If cost of construction has to be minimized, shelter can be a simple roof erected on pillars covering 10 to 20% more than the required area for the birds. The walls can be without foundation and made of locally available material. Instead of doors, a gate may be provided. Both gate and walls must be of sufficient height to restrict the birds inside the house during night time. The structure can be at the centre or at any of the corners of the enclosure. Arrangement for feed and water can be made within the shelter.

Birds move into the shelter whenever they want even during the day. Calculation of dimensions is same as explained in Unit 1 except that the floor space required should be taken as follows:

Table 2.1: Shelter and Land Allowances, m² per bird

Species	Shelter	Land
Ducks, up to 8 weeks	0.180 (2.00)	1.00 (11.11)
Ducks, adults*	0.225 (2.50)	2.50 (27.88)
Turkeys, up to 12 weeks**	0.100 (1.11)	0.60 (6.67)
Turkeys, 12 to 16 weeks	0.100 (1.11)	1.50 (16.67)
Turkeys, 16 weeks to market	0.100 (1.11)	2.00 (22.22)
Breeding birds	0.100 (1.11)	2.50 (27.78)

Values in the brackets are in sq ft.

* Arrangement for swimming 0.9 m wide and 20 to 30 cm deep pool; this is not compulsory.

** During brooding up to 8 weeks, they need 0.116 m² per bird.

Note: Both turkeys and ducks can be reared completely indoor (intensive system) including in total confinement in cages. Cages should be suitably designed.

Source: Ensminger, 1993

2.3.2 Intensive System

As you are already aware, in intensive system, birds are totally restricted within a house. Therefore, house construction must meet all the requirements of the birds reared inside. You have also learnt what “Cross-section” and “Floor diagram” means in this previous unit. The different housing designs under intensive system are discussed below:

(i) Deep litter system

If you remember that deep litter system was discussed in the previous unit while studying the principles of housing. The same designs are applicable here also. Hence, you can look at Fig 1.6 and 1.7 in unit 1 for details.

(ii) Cage system

The birds in this system are completely restricted within a cage. In unit 1, you have also studied the cage design (Fig 1.9) of a 3- bird cage which is most commonly employed throughout the world.

(a) Conventional type

Actually, when the cage system was introduced, it was the form in which it is popular today. The conventional cage system did not have the passages raised above the ground level as you can see in the Fig. 2.5.

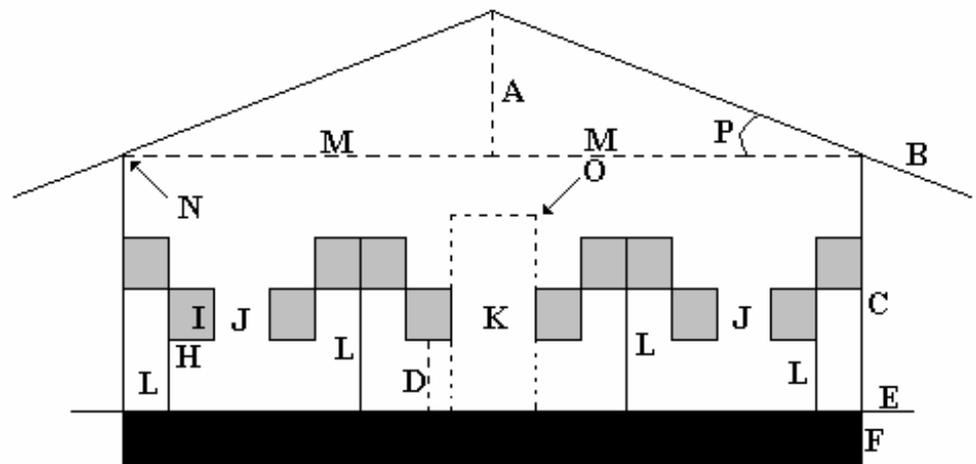
Look at the cross-section carefully (Fig. 2.5). You can notice that like a deep litter house (Fig 1.6, Unit 1), this also has plinth and side walls. Can you see that there is no side wall made of brick? In fact, there is no need of side wall at all. For security purposes and to fix roof, the side wall will be covered with chicken mesh or expanded metal spread between pillars for trusses. Naturally, you will be interested to know the reason for this.

You have learnt that in cage system, more birds can be grown in the same area than in any other system. Therefore, the following problems arise:

- More heat is produced.
- You know that while breathing, carbon dioxide is produced. In the same way, more carbon dioxide will be produced in cages.
- More faecal matter and therefore more water is excreted and evaporated into the house. This increases humidity inside the house.
- More faecal matter also means more action of bacteria on faeces and therefore more ammonia.
- These conditions are ideal for house-flies to breed and multiply. Naturally, fly problems will begin.

Then, how to overcome the above problems? Remember, from the previous unit that the orientation of the house was East-West restricting the wind flow. Therefore, the only alternative left to drive out excess heat, moisture, carbon dioxide and ammonia is to open the side walls completely to increase air flow (ventilation) into the building. These are the reasons why side walls of a cage layer house are completely open.

Another aspect you should see is the space below the cages where faecal matter is collected. Only 0.6 to 0.75 m (2 to 3 ft) is available below the cages. This creates problem of drying as well as removal of litter.



- | | |
|------------------------------------|---|
| A rise, 0.60 to 1.20 m | B Overhang, 0.60 to 0.90 m |
| C Stud height, 2.10 to 2.40 m | D Height upto cages, 0.60 to 0.75 m |
| E Slide projection, 0.45 to 0.60 m | F Plinth, 0.30 m |
| G Width, 7.80 m | H Depth of the cage, 0.375 m |
| I Height of the cage, 0.45 m | J Slide passages, 0.90 m |
| K Central passage, 1.20 m | L Cage support, 0.08 to 0.10 m |
| M Run, 3.90m | N Eaves |
| | O Door, 1.80 m × 1.20 m |
| | P Pitch, angle depending on A and G (normally < 30) |

Fig. 2.5: Cross-section of a Conventional cage layer house

Carefully look at Fig 2.6 which shows the floor diagram of a conventional cage layer house. Flooring is made only in the areas marked “Passages: whereas, the areas marked “Dropping pit” should be left as raw ground itself. You wish to know why?

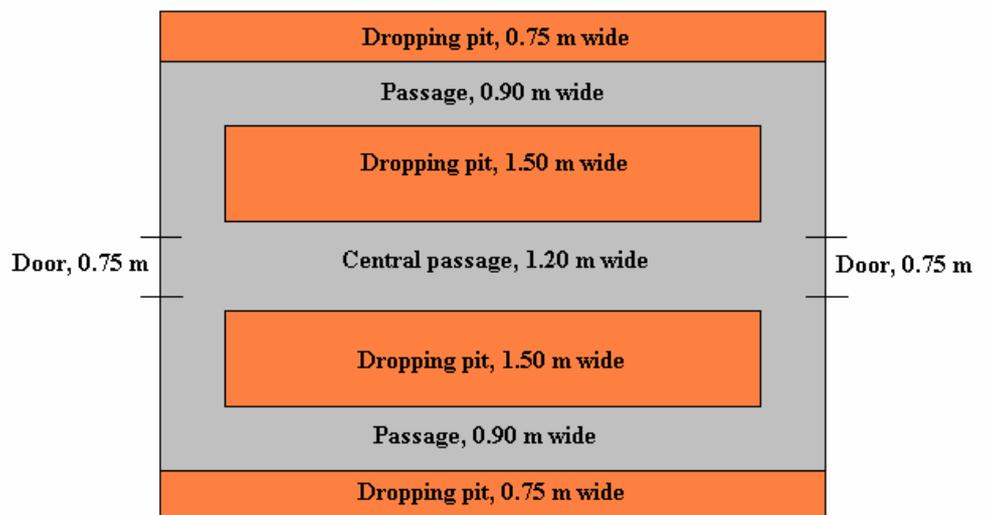


Fig. 2.6: Floor diagram of a conventional cage system

You are aware that in cage system, there is no litter material spread on the floor. Hence, if the flooring is laid over the entire floor, water in the faecal matter cannot be absorbed. This adds to the humidity problem in addition to the already existing problem of housing more number of birds. Therefore, to assist removal of water, dropping pits are left as raw ground, while flooring is laid.

(b) High-rise

If you look at the cross-section of a high rise house carefully, you will again notice that there is no side wall made of brick for the same reasons explained above. The entire floor is left as raw ground because all the passages are raised 2 m above the ground level.

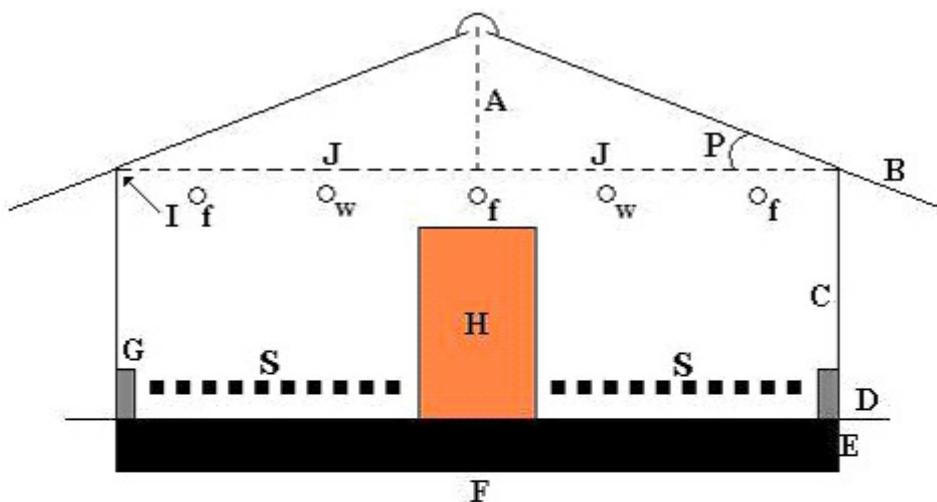
Can you assess any other advantages of this system? I am sure you can. They are as follows:

- The height is more than any type of poultry house. This obviously increases volume of air which can absorb heat. Hence, heat build-up is reduced.
- More air can circulate across the house which can drive away more quantities of moisture, carbon dioxide and ammonia.
- Since moisture and heat are reduced, problem of flies is also reduced.
- Removal of litter is extremely easy. In fact, the cages are 2 m above the ground. Hence, even a small tractor can move underneath the raised platforms!

The above reasons have made most of the conventional poultry houses replaced by high rise houses.

(c) All Slat system

This housing system is not popular in our country. However, diagrams of cross-section and floor diagram are given below (Fig. 2.7 and 2.8). Since you are now familiar with such diagrams, you should be able to visualize the house design easily now.



- | | |
|--|---|
| A Rise, 0.60 to 1.20 m | B Overhang, 0.60 to 0.90 m |
| C Stud height, 2.10 to 2.40 m | D Slide projection, 0.45 to 0.60 m |
| E Plinth, 0.30 m | F Width, Maximum 9 m |
| G Side wall, 0.30 to 1.20 m depending on climate | |
| H Door, 1.80 m x 1.20 m | I Eaves |
| J Run, Maximum 4.5 m | P Pitch, angle depending on A and F (normally < 30) |
| S Slats | |

Fig. 2.7: Cross-section of All slat system

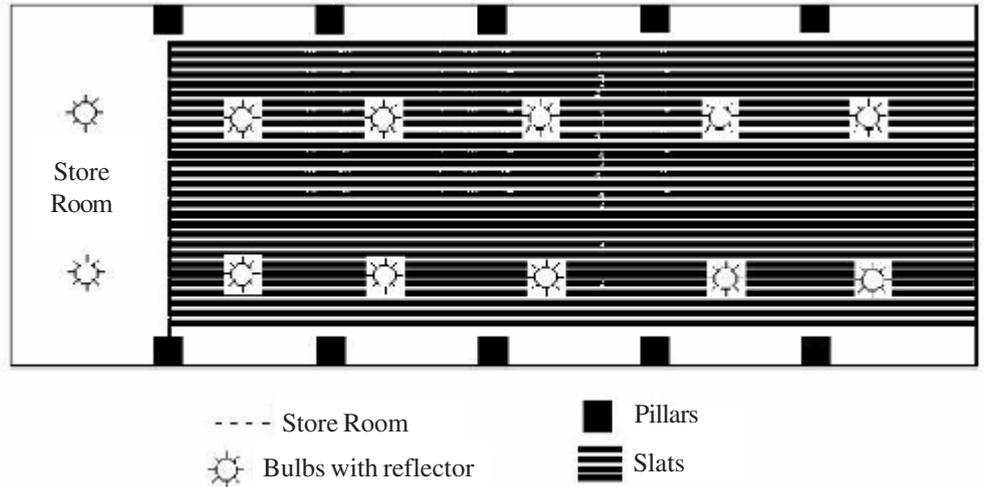
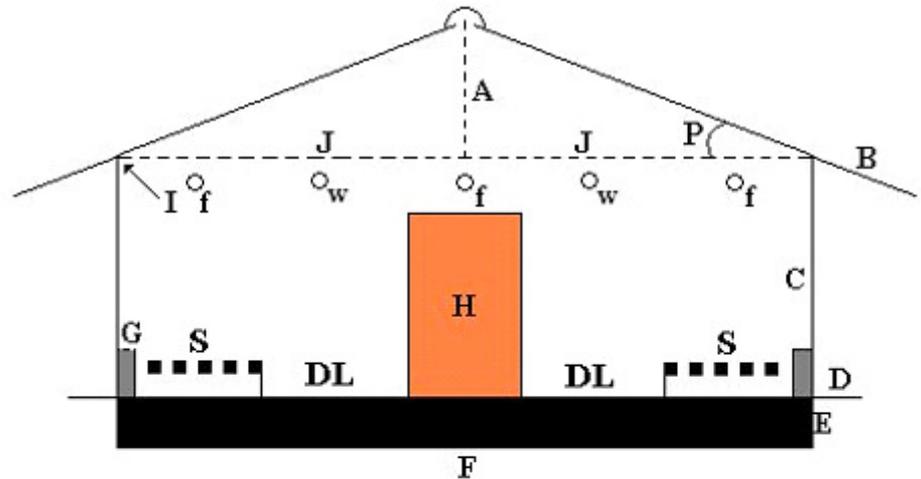


Fig. 2.8: Floor diagram of All slat system

(d) Slat and litter system

Similar to all slat system, cross-section and floor diagram of slat and litter system are provided below (Fig. 2.9 and 2.10).



- A rise, 0.60 to 1.20 m
- B Overhang, 0.60 to 0.90 m
- C Stud height, 2.10 to 2.40 m
- D Slide projection, 0.45 to 0.60 m
- E Plinth, 0.30 m
- F Width, Maximum 9 m
- G Side wall, 0.30 to 1.20 m depending on climate
- H Door, 1.80 m × 1.20 m
- I Eaves
- J Run, Maximum 4.5 m
- P Pitch, angle depending on A and F (normally < 30)
- S Area covered by Slats
- DL Area under Deep litter

Fig. 2.9: Cross-section of Slat and litter system

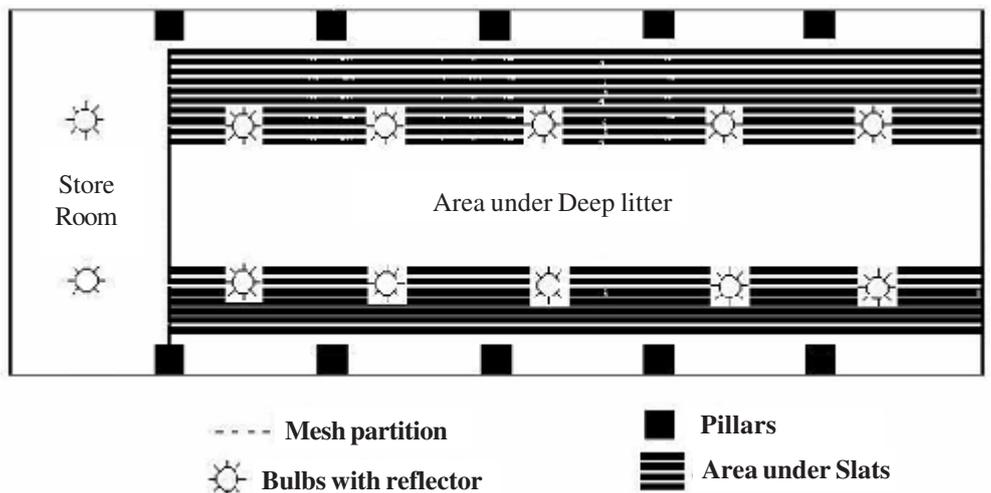


Fig. 2.10: Floor diagram of Slat and litter system

Activity 2

Visit a nearby poultry farm and note down the system of rearing practised for different types of poultry. Draw the cross-section view and floor diagram of the poultry shed.

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2.4 HOUSING DESIGNS OF OTHER POULTRY

Other poultry, which are grown commercially, include Turkey, Duck and Japanese Quail. Section 2.3.1 of this unit gives the description of the houses on semi-intensive system. Intensive housing of these species is discussed below:

2.4.1 Housing Ducks and Japanese Quails

Ducks and quails are essentially reared in cages from the chick stage itself. You will definitely ask why not ducks and quails on floor. The reasons are as follows:

- Ducks produce faecal matter which has very high water content than chicken. Therefore, litter material becomes very wet and leads to more problems than without litter.
- Japanese quails are very small in size and they can fly.

Note: This is the reason why ducks are popularly grown in semi-intensive system. The floor of the house is cleaned regularly during the day when they are left out of the shelter.

Therefore, these two species are preferable reared in cages. You would get the next obvious doubt; how to rear chicks in cages? Chicks are reared in what are called “Battery Brooders”. Its design is given in Fig. 2.11.

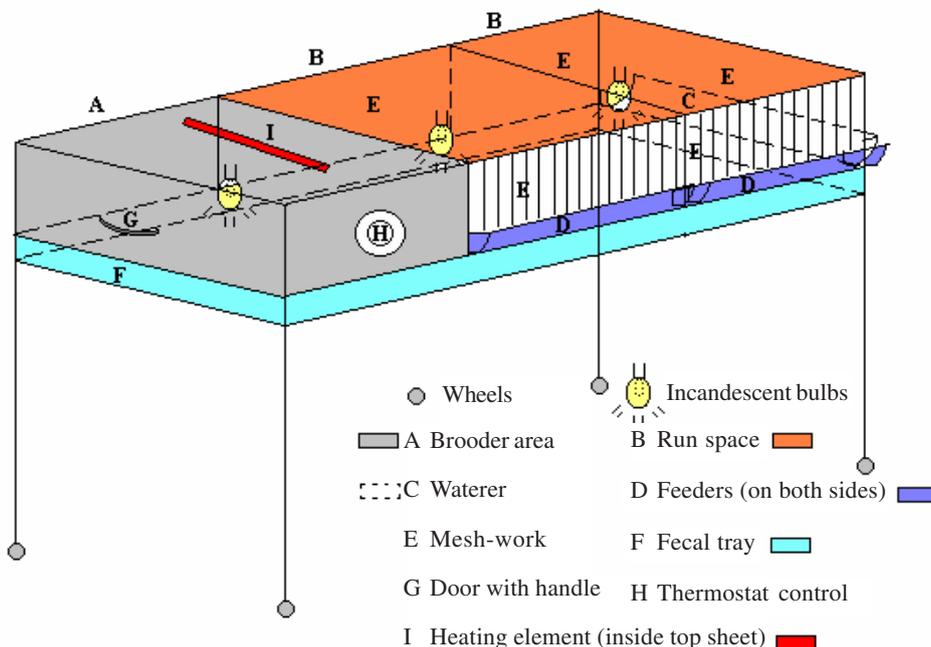


Fig. 2.11: Battery Brooder

Note: The term “Brooding” refers to the additional heat provided to the chicks during their first 4 weeks of age. Since these battery tiers provide heat to chicks, they are referred to as battery brooders. You will be learning more details of brooding in Block 2 unit 2.

A battery brooder consists of 4 to 5 tiered batteries (Fig. 2.12). Each tier has “heating space” (Fig. 2.13) comprising of one third of the total area and the remaining portion is called “run space”. The heating unit consists of an electric heater with a thermostatic control. The heating space is also covered with false-roofing made of Galvanized Iron (GI) to trap the hot air. The droppings (faecal matter) fall directly into the faecal trays. Usually, each of the tiers measures 150 to 180 cm long, 75 to 90 cm wide and 30 to 40 cm high. Each of these tiers can accommodate 25 to 35 chicks or ducklings until 6 to 8 weeks of age. Therefore, you can calculate that in an area where only 18 broilers can be grown till market age, nearly 100 broilers can be reared in a battery brooder.



Fig. 2.12: Battery Brooder for Quails



Fig. 2.13: Heating Space

(a) Advantages

- More chicks can be reared in a given area.
- There will be no litter-borne diseases.
- Since movement is restricted, birds spend less energy and hence feed efficiency will be improved.
- More chicks will survive in this method.
- Labour requirement is minimum.
- Control of temperature is more accurate.

(b) Disadvantages

- Initial investment is very high.
- Birds are uncomfortable because of restricted movement.
- Broken legs, breast blisters and others diseases may appear.
- Faecal trays need to be regularly cleaned.

Depending on the number of battery brooders to be housed, building dimensions will be calculated. You must take care that at least 3 m (10 ft) distance is allowed all round a battery brooder for easy movement and to perform day-to-day activities.

Japanese quails start laying eggs by 8 weeks of age. The laying cages are exactly of the same design as that for chicken except for dimensions to suit small size. Quail hens weigh about 180 to 200 g as against 1.6 to 2.0 kg by a hen. The dimensions

are 25 cm width, 15 cm height and 15 cm depth. Egg space is 2.5 to 3.0 cm and rolling space is 8 cm. Since they are considerably small in size, 5 tiers of cages (Fig. 2.14) can be laid in a building in L or M arrangements similar to the ones shown in Fig 1.10 of Unit 1.



Fig. 2.14: Five-tier cages

2.4.2 Housing Turkeys

Houses for in-door rearing of turkey are similar to that of chicken. However, the dimensions have to be calculated using the floor space requirements of turkey which are given in Table 2.2. Turkeys are generally reared on deep litter.

Table 2.2: Floor Space Requirement of Turkey

Age	Floor Space (in m ²)
Brooder space	0.003
0-4 weeks	0.135
4-8 weeks	0.180
8-12 weeks	0.270
>12 weeks	0.450
Adult	0.720
<i>Adapted from: Wilson et. al., 1997</i>	

Check Your Progress 2

- Note:** a) Use the space given below for your answers.
 b) Check your answers with those given at the end of the unit.

1) What are the problems expected in a cage layer house?

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2) What are the advantages of high rise house over a conventional cage layer house?

.....

3) What are the advantages of battery brooding?

.....
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2.5 LET US SUM UP

Poultry Housing has witnessed several changes. Chicken which were reared at the backyard (extensive system) as a hobby are now raised intensively within houses constructed with a specific purpose keeping in view of their requirements. Intensive system of housing consists of deep litter, cage, all slat and slat and litter systems. Even the conventional cage system has been mostly replaced by high rise cage layer houses. Most broilers are reared on deep-litter whereas most layers are housed in cages. Other poultry like ducks and turkeys are grown in semi-extensive system in which shelter is provided only during night time. However, they can be grown totally indoors on deep litter and cages. Japanese quails are essentially grown in cages because they fly and are very small. Battery brooder is used to provide additional heat during first 4 weeks of age and later on quails are shifted to laying cages which are similar to but of smaller dimensions than the laying cages for chicken. Laying ducks can also be reared in cages but turkey hens are popularly grown on deep litter.

2.6 GLOSSARY

- Battery Brooder** : An equipment having 4 to 5 tiers each provided with heating space and run space used for brooding and growing chicks up to 8 weeks of age.
- Brooding** : Providing additional heat to the chicks during first 4 weeks of age.
- Deep Litter** : Accumulated litter material spread on the floor and the faecal material over a period of time.
- Desi** : Local birds.
- Dropping Pit** : Space provided under the cages without flooring.
- Extensive System** : Birds reared freely without any specific building.
- Humidity** : Amount of moisture in air.
- Intensive System** : Rearing many birds within a building.
- Run Space** : Space without a source of heat for chicks to run around.

2.7 SUGGESTED FURTHER READING

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2.8 REFERENCES

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2.9 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) The word “Intensive” means more concentrated or more numbers per unit area or more intensity. Therefore, in all the systems under this category, more birds can be reared in a given area than in semi-extensive or extensive systems. The material which is spread to absorb moisture is called as “Litter material”; with faeces produced by the birds accumulates in litter and becomes deeper day by day. Hence, the system is referred to as “Deep litter system”.
- 2) A good litter material should:
 - be light in weight;
 - be fairly coarse to prevent caking/packing;
 - be highly absorbent;
 - dry rapidly by releasing absorbed moisture into the incoming air;
 - be soft and compressible;
 - be cheap;
 - form part of the manure; and
 - be easily available during all times of the year.
- 3) Advantages of cage system are as follows:
 - This system can accommodate more number of birds in a given space than any other system.
 - Movement of birds is restricted and hence they consume less feed when compared to other systems.
 - There will be less wastage of feed because movement is restricted.
 - No problem of litter-borne diseases, especially coccidiosis.
 - Spread of disease is slower than other systems.
 - Incidence of cannibalism is minimum.
 - Birds lay more and heavier eggs.
 - Consume less feed per dozen eggs produced.
 - Eggs will be cleaner than in other systems.
 - Broodiness is avoided.
 - Labour requirement is minimum.

Check Your Progress 2

- 1) The problems expected in a cage layer house are:
 - More heat is produced.
 - More carbon dioxide will be produced.
 - More faecal matter and therefore more water is excreted and evaporated into the house. This increases humidity inside the house.
 - More faecal matter also means more action of bacteria on faeces and therefore more ammonia.
 - Conditions are ideal in a cage layer house for house-flies to breed and multiply.
- 2) Advantages of high rise house over a conventional cage layer house are as follows:
 - The height is more than any type of poultry house. This obviously increases volume of air which can absorb heat. Hence, heat build-up is reduced.
 - More air can circulate across the house which can drive away more quantities of moisture, carbon dioxide and ammonia.
 - Since moisture and heat are reduced, problem of flies is also reduced.
 - Removal of litter is extremely easy. In fact, the cages are 2 m above the ground. Hence, even a small tractor can move underneath the raised platforms.
- 3) Advantages of battery brooding:
 - More chicks can be reared in a given area.
 - There will be no litter-borne diseases.
 - Since movement is restricted, birds spend less energy and hence feed efficiency will be improved.
 - More chicks will survive in this method.
 - Labour requirement is minimum.
 - Control of temperature is more accurate.