BROODING MANAGEMENT
MANAGEMENT OF CHICKS

PRINCIPLES OF BROODING

METHODS OF BROODING

PREPARATION FOR ARRIVAL OF CHICKS

PREPARATION AFTER ARRIVAL OF CHICKS

BROODING MANAGEMENT
Principles of brooding

Newly hatched chicks cannot regulate their body temperature

a) They lack feathers (down feather only)

b) Poikilotherm to homoeotherm just three days prior to hatching

c) Hypothalamus, the thermoregulatory centre, will not be completely functional.

d) Provide artificial heat during the initial stages - depends on the environmental temperature
a) The temperature at the beginning is 35°C which has been reduced at a rate of 2.8°C per week.

b) This duration varies between one week to three weeks

c) Windows/ side opening may be closed by curtains during the night and/or daytime depending on the season and environment temperature.

d) Curtains are lowered to open the upper portion of the windows to facilitate easy exit of hot air
Brooding temperature Vs body temperature

Brooding temperature is lower than body temperature (41.7°C) because, birds, being homoeothermic, used only 50% of the actual energy released by respiratory chain (in mitochondria) and the remaining 50% of energy is released into the cell medium for thermoregulation.

They may have to use heat to drive the extra heat to the environment against temperature gradient.

Poultry lack sweat glands and their metabolic body size is very high.
<table>
<thead>
<tr>
<th>Species</th>
<th>1-7d</th>
<th>2week</th>
<th>3week</th>
<th>4week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken, Quail, G. fowl</td>
<td>35</td>
<td>32.2</td>
<td>29.4</td>
<td>23.9 to 26.6</td>
</tr>
<tr>
<td>Poults</td>
<td>36</td>
<td>32.2</td>
<td>28.3</td>
<td>24.4</td>
</tr>
<tr>
<td>Ducklings</td>
<td>29.0</td>
<td>23.0 to 26.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goslings</td>
<td>29.0</td>
<td>23.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Whole house start at 33°C; then 29°C after 12 hr
CLASSIFICATION OF BROODING

• Natural brooding
• It is done with the help of broody hens after hatching, up to 3 to 4 weeks of age.
Artificial brooding

- In artificial brooding large number of baby chicks are reared in the absence of broody hen.
- Equipments used for brooding are called brooders
  - Heating source
  - Reflectors
  - Brooder guard
- Heating source - electrical, gases like natural gas, LPG and methane, liquid fuel like kerosene and solid fuel like coal
Charcoal stove / kerosene stove

Where electricity is not available, ordinary charcoal / kerosene stoves are used to provide supplementary heat to chicks.

- These stoves are covered with plate / pans to dissipate the heat.
Gas brooder

– Natural gas, LPG or methane is connected to heating element which is hanged 3 to 5 feet above the chick to provide heat.
Electrical brooder

• It is also thermostatically controlled heating system that spread required amount of heat uniformly above large area, this avoid crowding of chicks under brooder directly.

• One electrical brooder can be used for 300 to 400 chicks.
Infra-red bulbs

It is a self reflecting bulb. One 250 watts IR bulb can provide brooding for about 150 to 250 chicks.
Reflectors

Flat type hover – These hovers are provided with heating element and pilot lamp and in some cases thermometer.

Canopy type hover – These reflectors are in concave shape consisting of ordinary electrical bulb, thermostat mechanism and in some cases thermometer.
Brooder guard / chick guard

– They are used to prevent chicks from straying too far away from heat supply
– Provide brooder guard with a diameter of 5 feet, height of the brooder should not exceed 1.5 feet.
– For this purpose, we can use materials like cardboard sheet, GI sheet, wire mesh, and mat etc.
– During summer season, brooding is done for 5-7 days. In winter season it is 2-3 weeks.
Methods of Brooding

Spot Brooding

Floor Brooding

Canopy Brooding

Infra-red Brooding

House Brooding

Battery Brooding

Whole house

Partial house
Heating systems

1. Spot-heating:
   Floor Brooders (canopy/hover brooders or infra-red bulbs) are used to keep specific area(s) within a building at the desired temperature.
   Battery brooders/ cage brooding also fall into this category.
   Spot-brooding is common in conventional/windowless housing systems with manually operated or automatic curtains fit to the side-walls.
   Use brooder guards to contain chicks within brooder area.
   Brooder guards are usually 30 cm high and made of cardboard.
House heating

2. In environmentally controlled houses wherein entire brooder house or part of it is heated.

a) **Whole house heating:** In this system, it is very convenient to alter the temperature precisely as per the requirements of the chicks. Chicks can move freely in the entire area, no brooder guards restricting their movement.

b) **Partial house heating:** temporary plastic walls partitioning off about $\frac{1}{3}$ of the brooder house. Generally, 20-25 chicks/m² are brooded; no need of canopy/hover or infra-red bulb or a battery brooder and hence observation of the chicks is easy.
Canopy brooding-Floor

In this method, an umbrella-like canopy with three to four incandescent bulbs (60 to 100 W each depending on the season) fixed at the centre, is inverted and hung in such a way that the birds can move freely in and out of it.

The bulbs heat the air and the hot air is trapped by the canopy preventing the escape of hot air thereby providing warmth to the chicks.

The brooder area is delineated by the brooder guard which is 30 cm high and 60 to 75 cm away from the edge of the canopy.

The brooder guard is arranged in a circular fashion so as to avoid corners and dark areas.

The canopy measuring 90 cm diameter can accommodate about 250 chicks.
Paper on litter

For the first seven to ten days, paper is spread on the litter material and feed or maize grit is sprinkled on it. Avoid the chicks eating the litter material.

In addition, birds move freely throughout the brooder area; and hence, if the droppings are uniformly distributed on the paper, it indicates the correctness of the brooder temperature.

On the contrary, if the droppings are distributed only within the canopy area- temperature insufficient.

If the droppings are near the brooder guard,- high temperature inside the canopy

If the droppings are noticed as a triangle with the apex towards the centre of the canopy, it is suggestive of draft blowing from the direction corresponding to the base of the triangle.
Testing comfort of chicks

- Correct
- TOO COLD
- TOO HOT
- DRAFTY
Feeders and waterers

The feeders are arranged like spokes in a wheel in the brooder area with half the length of the feeders inside the canopy area.

The waterers are arranged next to feeder alternatively.

To ensure both feed and water within 30 cm of distance from any part of the brooding area.

Person looking at the brooder house should have the “chicken sense“ and must be able to judge the comfort of the birds without the aid of a thermometer.
Arrangements for brooding

- Brooder/Hover
- Brooder guard
- Feeder
- Waterer
Circular Vs Linear feeders

Linear feeder

Circular feeder $(R > r)$
Infra-red brooding

No need of canopy because the infra-red light heats any object that comes in contact with it but not the air.

Infra-red red and infra-red white bulbs of 150 and 250W are available which can be suffice for 75 to 100 and 125 to 150 chicks, respectively.

The bulbs must be hung at least 25 to 30 cm above the litter floor; otherwise, the litter material itself may catch fire, especially during summer.
Infra-red brooding

Advantages:

1. Infra-red light has been found to have some germicidal effect
2. Infra-red light has been found to reduce cannibalism; infra-red red bulbs
3. Brooding cost, on a long run, has been found to be lower
4. Infra-red enhances Vitamin D synthesis.
Battery/ cage brooding

It consists of 4 to 5 tiered batteries each of which has the heating space comprising of one thirds of the total area and the remaining portion as the “run space”.

The heating unit consists of an electric heater with a thermostatic control

Paper is spread of the mesh flooring and after 10 days it is removed so that the droppings fall directly into the fecal trays.

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 50 to 75 broiler chicks or 75 to 100 layer chicks up to three weeks of brooding
Advantages:

1. Housing density is high.
2. No litter-borne diseases
3. Feed efficiency improved
4. Survivability will be higher
5. Labour requirement is minimum

Disadvantages:

1. Initial investment is high.
2. Birds are uncomfortable.
3. Broken legs, breast blisters and other carcass defects may appear, especially in case of broilers
Preparation of the house for arrival of chicks

1. Cleaning and disinfection of brooder house.

2. Cleaning and disinfection of feeders and waterers followed by sun-drying.

3. House must be thoroughly examined for leaking roof and gutters, functioning of fans, switch-boards, shutters etc.

4. The floor may be given a coat of lime solution.

5. Checking of brooders, feeders, waterers and other equipment required during the brooding period.
5. New and clean, dry, mould-free absorbent litter has to be spread evenly on the floor to a thickness of about 5 to 7.5 cm.

6. Paper is spread on the litter.

7. Brooder, feeders and waterers are arranged at least 6 to 8 hours before the arrival of chicks.

8. Brooder is put on so that requisite brooder temperature is attained before the arrival of chicks.

9. Anti-stress factors (B-complex vitamins, vitamin C etc.) may be added in water.

10. Feed or maize grit is sprinkled on paper to help chicks identify the feed.

11. It is desirable to have a standby generator to meet power failure.
Preparation of the house after arrival of chicks

1. It is advisable to examine a sample of chicks from each of the chick boxes to ascertain the quality

2. It is a good practice to dip the beaks of the newly hatched chicks in water at drinkers and leave them into the brooder area

3. Chicks have to be observed carefully to identify weak ones and also to help those which are not able to reach feed and water.

4. Ensure that all the chicks are actually eating - well distended crop.
Drinkers have to be cleaned and freshwater to be given at least twice a day

Similarly, feed also offered at least twice a day

In case of Japanese quails, which have a tendency to get drowned

Put colored beads / pebbles so as to avoid drowning as well as to attract them to drinkers.
## Floor space

<table>
<thead>
<tr>
<th>Birds</th>
<th>All –litter (sq.cm)</th>
<th>Cages (sq.cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Broiler 0-3wk</strong></td>
<td>450</td>
<td>250</td>
</tr>
<tr>
<td>3-6wk</td>
<td>900</td>
<td>450</td>
</tr>
<tr>
<td><strong>Layers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chick 0-8wk</td>
<td>700</td>
<td>150</td>
</tr>
<tr>
<td>Grower 9-18wk</td>
<td>1500</td>
<td>300-350</td>
</tr>
<tr>
<td>Layer 18-72wk</td>
<td>1800</td>
<td>400-450</td>
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</table>
## Layer Feed – BIS-2007

<table>
<thead>
<tr>
<th>Contents</th>
<th>Chick 0-8</th>
<th>Grower 9-20</th>
<th>Layer-I 21-45</th>
<th>Layer –II 46-72</th>
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<tbody>
<tr>
<td>Moisture</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>CP</td>
<td>20</td>
<td>16</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>ME</td>
<td>2800</td>
<td>2500</td>
<td>2600</td>
<td>2400</td>
</tr>
<tr>
<td>EE</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CF</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>AIA</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4.5</td>
</tr>
<tr>
<td>Salt</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
## Broiler Feed – BIS-2007

<table>
<thead>
<tr>
<th>Contents</th>
<th>Pre starter 0-7days</th>
<th>Starter 8-21</th>
<th>Finisher 22-42</th>
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<tbody>
<tr>
<td>Moisture</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>CP</td>
<td>23</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>ME</td>
<td>3000</td>
<td>3100</td>
<td>3200</td>
</tr>
<tr>
<td>EE</td>
<td>3</td>
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<td>4.0</td>
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<tr>
<td>CF</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>AIA</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Salt</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Light

Duration:

During brooding 23hr light + 1 hr darkness is provided. Under canopy brooding, light serves two purposes:

1. Illumination for visibility and
2. Heating the air by convection to provide the required brooding temperature.
In all the methods of brooding, 1-hr darkness at a specified time of the day is provided mainly to acclimatize chicks for power failure; this would help to minimize panic huddling of chicks

Intensity:

- The recommended intensity of light is 37 lux for the first 48 hr. This can be effected by use of 10 W of light bulb per m² of floor space
- After 48 hr of brooding, intensity at the floor level can be reduced to 10 lux which can be supplied by use of 2.70 W of light bulb per m² of floor space
Unabsorbed yolk:
The normal practice of feeding chicks soon after they are left under the brooder slows down the absorption of yolk left over in the abdominal cavity. However, presence of unabsorbed yolk during the first 7d is not a serious condition unless it is associated with bacterial infection. Higher brooder temperature given for first 2d also contributes to unabsorbed yolk. The unabsorbed yolk may assume various colors like yellow, green and orange even in absolutely healthy chicks.
# Vaccination schedule – brooding period

<table>
<thead>
<tr>
<th>Age</th>
<th>Disease</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th day</td>
<td>Lasota</td>
<td>Ocular or nasal</td>
</tr>
<tr>
<td>14th day</td>
<td>IBD</td>
<td>Ocular or nasal</td>
</tr>
<tr>
<td>21st day</td>
<td>IBD</td>
<td>Ocular or nasal or water</td>
</tr>
<tr>
<td>28th to 30th day</td>
<td>ND + IB</td>
<td>Ocular or nasal or water</td>
</tr>
<tr>
<td>5th to 6th week</td>
<td>Coryza*</td>
<td>S/c (neck)</td>
</tr>
<tr>
<td>7th week</td>
<td>Fowl pox</td>
<td>S/c (wing stab)</td>
</tr>
</tbody>
</table>
THANK YOU
POINTS TO REMEMBER

• After culling the previous adult birds, clean and disinfect the poultry house.

• 3 to 4 weeks interval may be provided between 2 batches as down tome.

• Form a circle of about 5 feet diameter with brooder guard. The 5 feet diameter brooder can hold about 200 to 250 chicks.
• At the centre of brooder guard, provide any one of heat source like IR bulb, ordinary incandescent bulb or gas brooders.

• Spread litter material about 2” height in a circle and then spread old newspaper over the litter material.

• Arrange feeders and waterers alternatively like cart-wheel fashion.

• Check the brooder for proper temperature 24 hours prior to arrival of chicks
• Switch on the brooder heating source several hours before the arrival of the chicks in order to maintain required brooding temperature.

• Spread ground maize or rava or fine mash / crumble feed on the old newspaper for 1 or 2 days. Afterwards, they will learn to consume feed from the feeder.

• Provide electrolyte, glucose and vitamins in the drinking water for first 2 to 3 days to overcome stress.
• After arrival of chicks, moist the beak and leave the chicks under heating source.
• Maintain a brooder temperature of 90 to 950°F for the first week and then reduce 50°F every week until it reaches the room temperature.
• Watch the behaviour of chicks in order to find out whether temperature provided is correct or less or more.
• In case of too much temperature, we can reduce the heat by reducing the power of the bulb or we can raise the heating element.

• In case of too low temperature, we have to supplement more heating source or we can further down the heating element.

• In case of chill weather or chill breeze, we can provide curtains towards the wind direction.
• Remove the old newspaper after 3 days and destroy it by burning. If necessary, spread another set of newspaper.
• Remove brooder guard after 7 to 10 days depending upon the season.
• While removing the brooder guard, see that the corners of the sheds are rounded in order to avoid mortality due to huddling
• Change the feeders and waterers according to age and requirement.
• 24 hours lighting programme may be adopted during 0-8 weeks of age.
• One hour darkness may be provided to train the chicks in case of any power failure.
• Medication programme: First and Second day – Electrolytes and vitamins.
• 3rd to 7th day – Antibiotics. (Other medications as and when required)