

**Food Safety Program /2<sup>nd</sup> Level 2<sup>nd</sup>  
Course: Animal Production 3 (Poultry)**

**Title of lecture : Brooding Of Chicks (1)**

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## **Brooding Of Chicks**

Brooding is the art and science of rearing baby chicks. A newly hatched chick does not develop the thermoregulatory mechanism fully and takes about two weeks to develop this mechanism and homeostasis. Therefore, they cannot maintain the body temperature properly for the first few weeks of life. Brooding can be classified into natural and artificial.

### **Natural brooding**

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

## 2. 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. Brooder comprises of three elements:

1. Heating source
2. Reflectors
3. Brooder guard

Heating source may be electrical; gases like natural gas, LPG and methane, liquid fuel like kerosene, solid fuel like coal, wood can be used as a heating material.

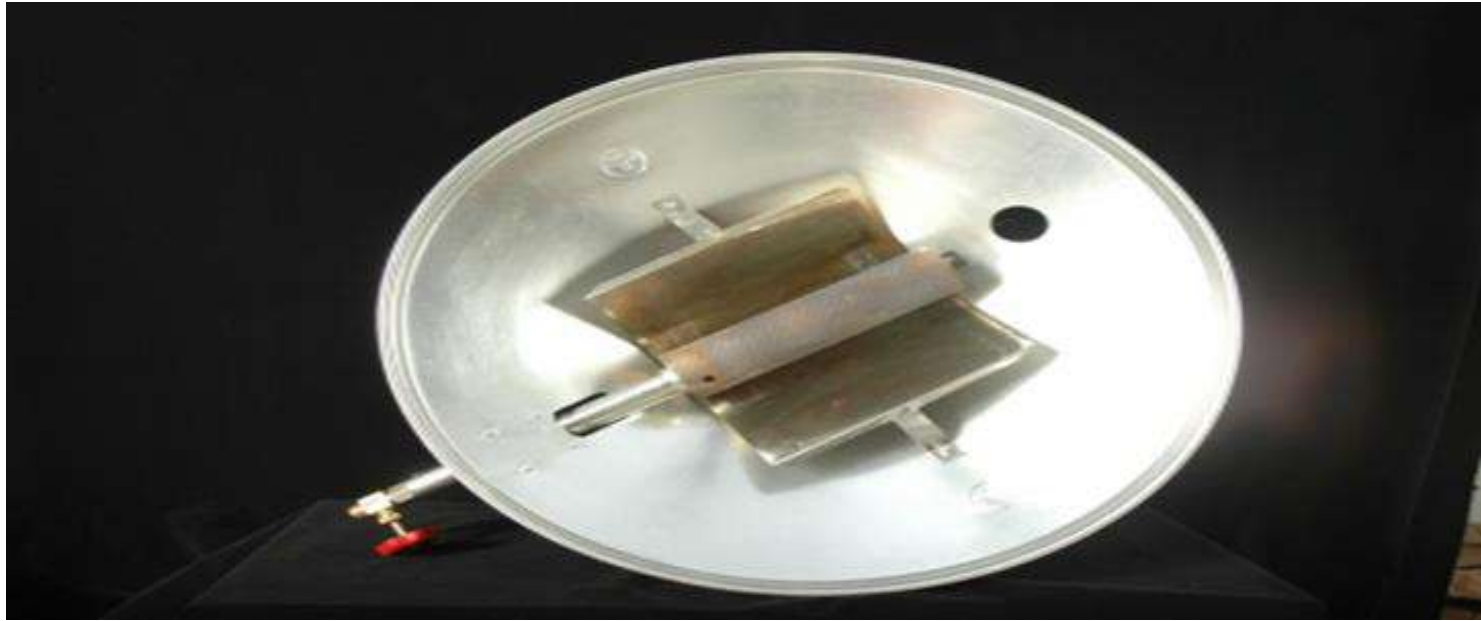
## Charcoal stove / kerosene stove:



**Charcoal stove**

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

## 2. 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.

### 3- Electrical brooder:



It is also thermostatically controlled heating system. One electrical brooder can be used for 300 to 400 chicks.

## 4 - Infra-red bulbs:



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

## 5- Reflectors:



These reflectors are called Hovers. Flat type hover –

These hovers are provided with heating element, heating mechanism and pilot lamp and in some cases thermometer is also there in order to record the temperature.



## **Receiving of chicks**

- After culling the previous adult birds, clean and disinfect the poultry house.
- 3 to 4 weeks interval may be provided between 2 batches as downtime.
- 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 center 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 95°F for the first week and then reduce 5°F every week until it reaches the room temperature.
- Watch the behavior 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).

- Environmental Factors to Control when Brooding Chicks

The main objective in brooding chicks is to efficiently and economically provide a comfortable, healthy environment for growing birds. Temperature, air quality, humidity and light are critical factors to consider. Failure to provide the adequate environment during the brooding period will reduce profitability, resulting in reduced growth and development, poorer feed conversion, and increased disease, condemnation and mortality.



Figure1. Managing the house and chick correctly during the brooding period will get chicks off to a good start.

# Temperature and Chick Physiology

Maintaining the correct temperature is critical in chick brooding, especially during the first two weeks of the chick's life. Early in life, the chick is poorly equipped to regulate its metabolic processes to adequately control its body temperature. As a result, the young chick is dependent on environmental temperature to maintain optimal body temperature. If the room temperature decreases, the chick's body temperature will decrease. Likewise, if room temperature increases, the chick body temperature will increase. Chilling or overheating during this crucial period can result in poor growth; poor feed conversion and increased susceptibility to disease.

The body temperature of a day-old chick is approximately 103 degrees F (39 degrees C), but by about five days of age body temperature is 106 degrees F (41.1 degrees C), the same as the adult.

While chicks are more tolerant of high temperatures than adult birds, high temperatures for extended periods of time increase mortality and have negative impact on performance.

Chicks brooded under 80 degrees F experienced reduced growth compared to the high brooding temperature treatment. The chicks reared under those temperatures did not catch up in body weight and as a result weighed less at market age than birds that were brooded properly.



Not only do chicks exposed to low brooding temperatures have reduce growth rates, but they will consume more feed to keep themselves warm, reducing feed efficiency and increasing feed costs.

### **Temperature and Chick Performance:**

One of the goals during brooding is to maintain chicks within their comfort zone, When birds are kept in environmental temperatures above or below their comfort zone, more energy must be expended to maintain body temperature. The energy from the feed will be used to maintain body temperature instead of growth and development resulting in poorer feed conversion. Note that the temperatures in Table 1 refer to air temperatures that are designed to provide a 90 degrees F (32 degrees C) floor temperature. When brooding chicks, floor temperature is crucial.

Research suggests that average floor temperature should be 90 degrees F (32 degrees C) on the day that chicks are placed in the house.

**Recommended Air Temperatures during Brooding for Broilers by**

**Heat :**

<b>AGE</b>	<b>Air Temperature</b>		
<b>Day</b>	<b>Forced Air Furnace<sup>2</sup></b>	<b>Conventional Brooder<sup>3</sup></b>	<b>Radiant Brooder<sup>4</sup></b>
<b>0</b>	93 ° F (34 ° C)	90 ° F (32 ° C)	88 ° F (31 ° C)
<b>3</b>	90 ° F (32 ° C)	88 ° F (31 ° C)	86 ° F (30 ° C)
<b>7</b>	87 ° F (31 ° C)	86 ° F (30 ° C)	84 ° F (29 ° C)
<b>14</b>	83 ° F (28 ° C)	85 ° F (29 ° C)	82 ° F (28 ° C)
<b>21</b>	78 ° F (26 ° C)	80 ° F (27 ° C)	77 ° F (25 ° C)

<sup>1</sup> Temperatures based on those used currently by broiler companies

<sup>2</sup> Measured at chick height.

<sup>3</sup> Measured at chick height, one foot from edge of brooder canopy.

<sup>4</sup> Measured at chick height, four feet from edge of brooder canopy.

In commercial broiler growing operations, broiler houses are insulated and equipped with mechanical ventilation systems to maintain house temperatures within 5 degrees of the desired temperature regardless of outside temperature.

The best method to monitor chick comfort is to observe chick behavior and regulate the temperature accordingly. When observing a broiler house, chicks should be distributed evenly across the house.



Figure 2. When adequate house temperature is obtained and chicks are well managed, they should be distributed throughout the house and not huddling together or sitting mostly in the feed pans.

Chicks that are cool can be seen huddling together (even next to the side wall) and will tend to sit in feeder pans. Chicks that are hot will move away from the brooders and furnaces, will pant and will stretch out on the litter in efforts to cool themselves.