

Food Safety Program /2nd Level 2nd
Course: Animal Production 3 (Poultry)

Title of lecture : Brooding Of Chicks (2)

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Lecture Number : 8

References : Commercial chicken meat and egg production...Fifth
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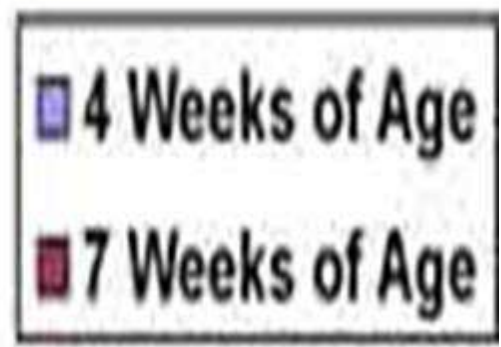
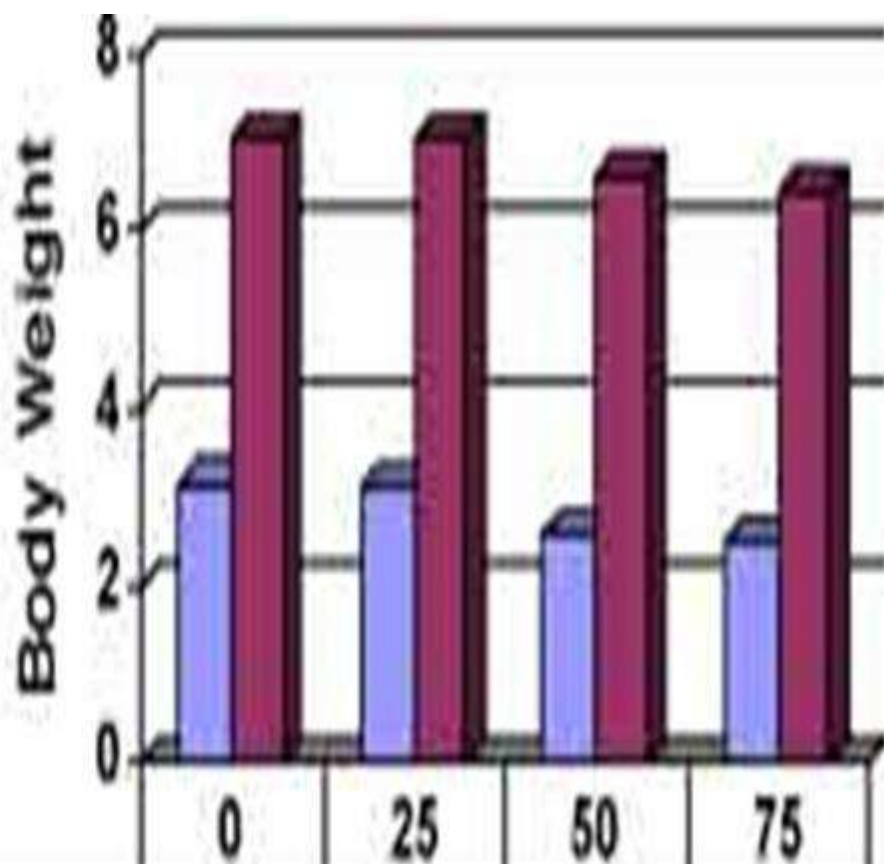
Relative Humidity

The ability of air to hold moisture depends upon its temperature.

It is recommended that a low level of relative humidity be maintained between 50 and 70 percent throughout the grow out period, including the brooding period. Ammonia production occurs due to the microbiological breakdown of fecal material in the litter. Dusty conditions in the poultry house are associated with relative humidity below 50 percent. Relative humidity of 70 percent or greater provides environmental conditions suitable for microbial growth in the litter.

increased ammonia impairs the immune system and increases respiratory disease in birds.

High ammonia levels during brooding reduces growth rate, which is not gained back during the remainder of the grow out. Ammonia production can be reduced through the control of relative humidity which in turn is regulated by ventilation. Managing the poultry house ventilation rates to keep relative humidity between 50 and 70 percent is recommended to minimize ammonia production and dust.



4 Weeks of Age	3.13	3.08	2.6	2.49
7 Weeks of Age	7.08	7.06	6.62	6.44

Ammonia (ppm)

Ventilation

Ventilation is needed to regulate temperature and remove carbon dioxide, ammonia, other gases, moisture, dust and odors. Fresh air must be introduced uniformly, mixed well with house air, and circulated properly throughout the house.

Figure 4. Air entering through the inlets is directed along the ceiling. This allows the air to warm up to brooding temperature before coming into contact with the chicks. This also increases the moisture holding capacity of the air so that when the warm air does fall down to chick level it will pick up and hold more moisture from the litter helping to maintain litter conditions in the house.



Mixing of the incoming outside air and the inside air prevents the cooler air from settling near the litter and chilling the birds.

Circulation fans should be used to break up temperature stratification and provide a more uniform temperature throughout the poultry house. Moving the warmer air to bird level not only helps maintain bird body and floor temperatures, but also helps remove moisture from the litter.

Fan operation is controlled by temperature to maintain the desired temperature. Some fans are operated by a timer to regulate relative

humidity and maintain good air quality when the house is at the desired temperature.

Lighting During Brooding:

Light is an important factor during brooding that should not be ignored. Chick activity is greater in bright light intensity than in low light intensity. During brooding the light should be at the brightest intensity to encourage chick activity thus assisting them to locate feed and water.

Light systems should be designed to produce a minimum of 25 lux (2.5 foot candles) or more at bird level. Many broiler houses being built today are capable of provide up to 40 lux (4 foot candles) at chick level in the brood area.



Figure 6. With an insulated attic, the air is warmer than outside air. Using the air allows higher ventilation rates to be used without increasing fuel usage. These increased ventilation rates will help maintain relative humidity between 50 and 70 percent.



Figure 5. Higher light intensities during brooding will encourage chick activity. The increase activity will help chicks find feed and water sources thus getting them off to a good start.

The lights are operated 23 hours a day during brooding and the light intensity is at maximum. Between 7 and 10 days of age the number of hours the lights are operated should be reduced (depending on the operation's guidelines) and by 10 to 14 days of age the light intensity should be reduced to 5 lux (0.5 foot candles). The main purpose of the lighting during the brooding is to ensure that chicks are active and seek out food and water sources.

Housing:

Chick brooders can be elaborate pieces of equipment such as tiered battery brooders (Figure 1) or as simple as a cardboard box (Figure 2) in the house or garage. In both cases, the most important aspect is to maintain conditions that allow the birds to thrive.



Figure 1.--An example of one type of battery brooder.

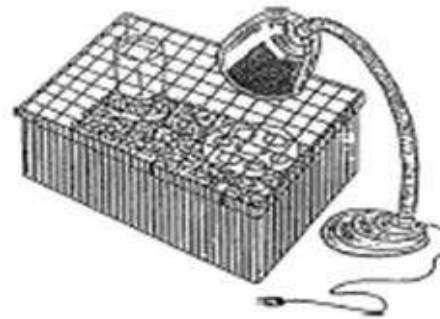


Figure 2.--Setup to brood a few chicks in a cardboard box or wire cage.

•Battery brooding

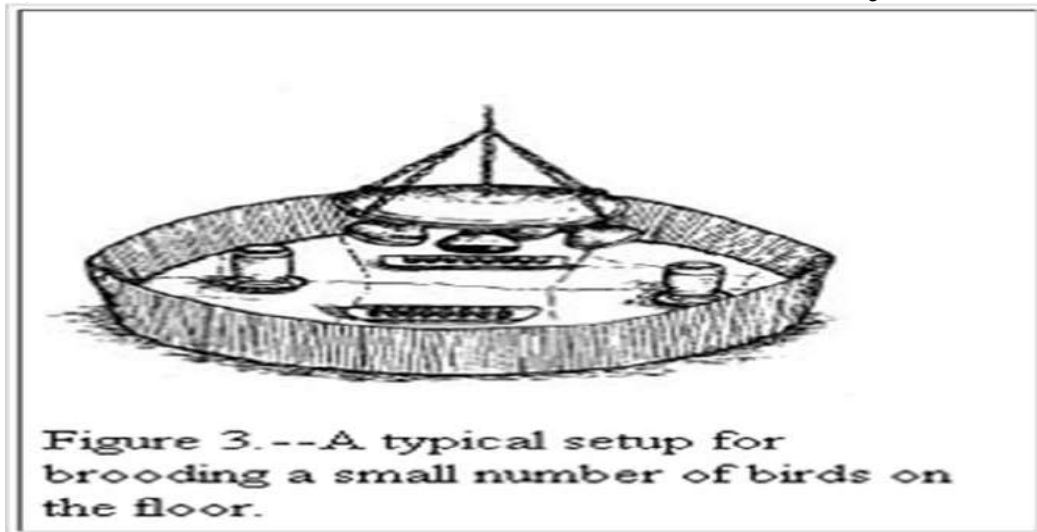
Because birds in battery brooders are kept in multiple layers, many chicks can be brooded in a relatively small amount of floor space. There are many designs. Most include an electric heat source at one end, The walls and floor of each brooding area most often are wire. A droppings pan under the wire floor requires regular cleaning. In many cases, feed and water are provided outside the brooding space, making management easier. Battery brooders are an excellent way to brood chicks in a small space. However, chicks can remain in these brooders only a few weeks before they outgrow them. In addition, the cost to purchase one of these units is high.

- **Floor brooding:-**

Most growers will choose to brood chicks on the floor (Figure 3). Some type of bedding material or litter is required. Litter must be absorbent and must insulate the chicks from the ground. Most important, litter must not be slippery. A slippery floor, such as newspaper, cardboard, or a glass-bottom aquarium. Ideal litter is sawdust or wood shavings; straw can be used if it is chopped into short lengths and is not moldy. Litter must be changed or top dressed (clean litter added over the dirty)

- **Draft shield**

A draft shield is cardboard or wires that surrounds the brooding area (Figure 3). The sides of a box used for brooding act as a draft shield. The draft shield provides two important functions. As its name implies, it reduces the possibility that drafts will reach the birds. It also keeps the birds close to feed, water, and heat. Draft shields can be removed after about 1 to 2 weeks, unless conditions are extremely cold or drafty.



- Heat.

For small numbers of birds, heat usually is provided by heat lamps or light bulbs. When large numbers (200 or more) are brooded together, it may be more economical to use propane heaters. Many types of heaters are available if desired.

Two methods of monitoring chicks' environmental temperature are used successfully. First, start chicks at about 95°F (measured near the heat source at chick height), dropping the temperature about 5°F each week until the birds are feathered or ambient temperature is reached.

Convertible

Too cold

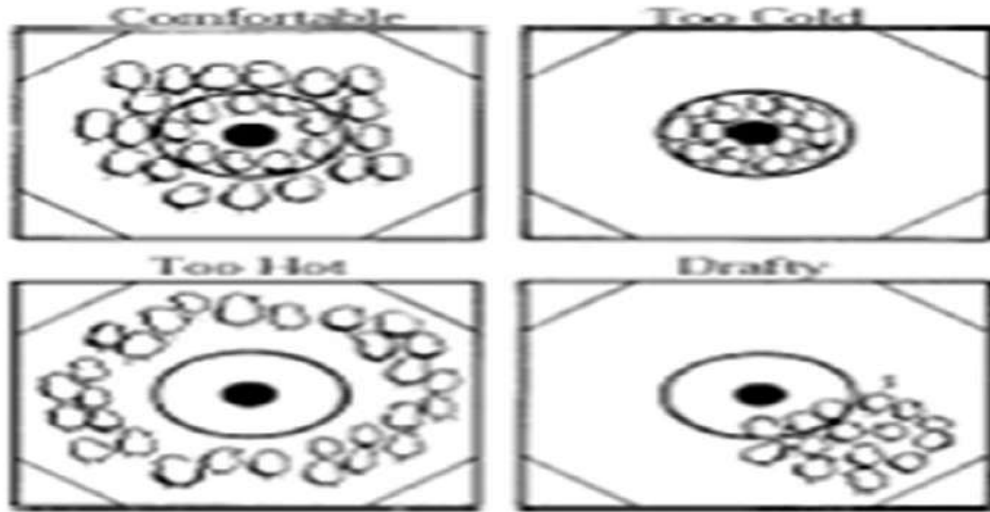


Figure 4.--Chick behavior can indicate their comfort level.

The second method relies on observing the chicks (Figure 4). If the chicks are all under the heat source, it is too cold; if they are all far away from the heat, it's too hot; if they are clumped away from the heat, it is drafty; if they are milling about in all areas of the pen, the temperature is correct.

Space requirements :-

Floor space

Baby chicks are small when they hatch but grow quite rapidly.

Broiler chicks reach 5 pounds in little more than 6 weeks. Therefore, chicks need space to grow. Space usually is not limiting in most small-flock situations; in fact, most chickens reared in small flocks have plenty of space.

Minimum space requirements are as follows:

- For broilers, 0.75 to 1 square foot per bird
- For Leghorns and bantams, 1.5 to 2 square feet per bird
- For heavy breeds, 2.5 to 3 square feet per bird
- For turkeys, 3 to 4 square feet per bird
- For game birds, double or triple the requirements for turkeys

Feeder and waterier space

Feeder space requirements vary with feeder type and the age of the birds.

when using trough feeders or waterers, allow 1.5 to 4 inches per bird. When using circular feeders or waterers, allow about 1 to 2.75 inches per bird.

Feeding

Chicks require a balanced diet if they are to grow and thrive. When starting chicks, always feed a starter diet that is formulated to give the birds the proper levels of nutrients. They should be fed free choice; that is, feed is available all the time.

Watering:-

Water must be provided constantly. It should be room temperature, clean, and fresh. make sure the water does not become too hot from the heat source because many birds will refuse to drink warm water.

Sexing:-

Determining sex in chickens usually is easy. By about 4 to 6 weeks, males begin to show comb, waddle, and spur development, and they begin to grow larger than the females. Some species of game birds and waterfowl require "vent sexing," a somewhat difficult procedure to examine their genitalia, to separate the sexes.