

# Brooding for Performance

Live Production Services

## A Critical Phase

Early in life, breeder pullets are given vaccines allowing them to produce antibodies that will be passed on to their progeny. These maternal antibodies travel through the hen's bloodstream to the egg yolk, then to the developing chick when the yolk sac is absorbed. Antibodies absorbed through the yolk sac help protect the chick from immunosuppressive viral disease, such as reovirus and infectious bursal disease found in the environment. These viruses may cause disease if the maternal antibodies from the yolk sac do not get into the chick's blood stream.

Once absorbed, the yolk material protects the chick for the first 10 to 15 days of life. After this time, the chick will make its own antibodies. If the chick is not managed properly, the yolk sac, and the antibodies contained in the yolk material, will not be absorbed by the chick. The primary factor that interferes with the absorption of the yolk material is **stress**. Stress also interferes with feed and water intake and ultimately performance.

Stress is a major problem for the chicks during the first two weeks of life. Stress is anything that causes the chick's adrenal gland to produce excess steroids, resulting in immunosuppression (the suppression of the bird's immune system). When a chick is stressed, the blood vessels surrounding the yolk sac constrict. This impedes the ability of the mesenteric vessels to transfer the antibodies and nutrients that the immature chick needs to thrive (Illustration 1).

If this yolk material is not absorbed, it will remain as foreign material in the chick's abdomen and the chick will not reach its full growth potential and feed conversion. Not only will the mature broiler experience decreased weight gains and increased feed conversion, the unabsorbed yolk may cause birds to be salvaged or condemned in the plant.



The brooding period of the broiler's life cycle is the most critical. At no other time during the broilers' life is the Service Technician's and the Producer's job more important. Mistakes made in this early phase of life cannot be corrected later on. This article will provide some insight on how to Brood for Performance.



Illustration 1: Yolk sac of a day old chick showing the mesenteric vasculature

## Proper Brooding Set-up

### Temperature

The number one cause of stress during brooding is cold temperatures. While being too hot can sometimes cause stress, it is not as dangerous as keeping the house too cold for the young birds.

Proper set-up of the house at brooding can minimize stress and enhance the performance of the flock. The most important thing Producers can do to prevent stress is to place the heat, feed, and water where it is very convenient for the chicks. Because chicks cannot regulate their own body temperature for about 5 to 7 days, they must move to, or away from, heat as needed to maintain body temperature. By placing feed and water in the chicks' path to its individual comfort zone, we utilize the natural behavior of the chick to increase the likelihood that it will eat and drink (Illustration 2).

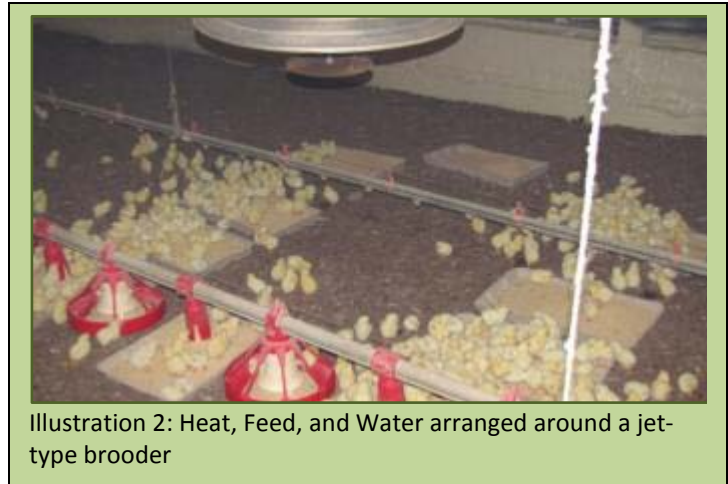


Illustration 2: Heat, Feed, and Water arranged around a jet-type brooder

Traditional comfort zone brooding practices with jet –type brooders requires the placement of feed and water around the heat source in a manner that takes advantage of the chick searching for their optimal temperature. The floor temperature under the jet brooder should be 104° to 106°F when the brooder is operating (Illustration 3). As technology has advanced, radiant brooders and tube heaters have become more common. Unlike the traditional jet brooders, these advanced brooders provide warm room brooding with uniform house and floor temperature of 90-92°F. Although this new brooding set-up allows for more automated feeding, it is still crucial that feed and water is readily available to chicks at all times. Brooders should be utilized for at least 7 days.



Illustration 3: 106°F under a jet-type brooder

After the seventh day, the portion of the chick's brain that controls body temperature matures. At this time, the bird will be able to regulate its normal body temperature of 105° to 106° F. This maturation occurs through the heat of digestion and exercise along with supplemental heat. At this point, some producers turn brooders off and use hot air furnaces, which are more efficient, to maintain a normal house temperature of 80 degrees to 85 degrees. Brooding chicks during any season of the year without lighting the brooders will cause stress. Remember, the chicks need heat for the first seven days, regardless of the season. An example of this is the huddling of young chicks on summer mornings.

## **Water**

Adequate water availability plays a role in minimizing stress and maximizing performance. Water systems must provide the proper amount of clean water to the birds (Illustration 4). Routine maintenance of the watering system includes, cleaning the lines between flocks with the appropriate sanitizers, activation of the nipples the day of chick placement, and replacing leaking nipples, replacing nipples that do not provide sufficient water.

It is important to monitor and adjust the water pressure by using clean site tubes (Illustration 5). Nipple drinkers should be positioned at the chicks' eye level on day one. After that, nipple height should be adjusted so medium-sized chicks can look and see the drop of water.



Illustration 4: Easily accessible water



Illustration 5: Clean site tube

## **Feed**

Early feed management is another important factor that impacts performance. Early feed intake is crucial for optimal weight gains and feed conversion. In order to provide proper feed space and feed availability, one feeder lid per 75 to 100 chicks should be placed in the brooding area (Illustration 6).

The equipment in a chicken house must be arranged to facilitate consumption of feed and water. Feeders and drinkers should be situated to attract chicks to the warmer parts of the brooding area. Prior to chick placement, feed pans and feeder lids that are not automatically flooded or filled should be supplemented with additional feed. This additional feed should cover the entire surface area of feed pans and feeders lids (Illustration 7).



Illustration 6: Heat, Feed and Water in new house

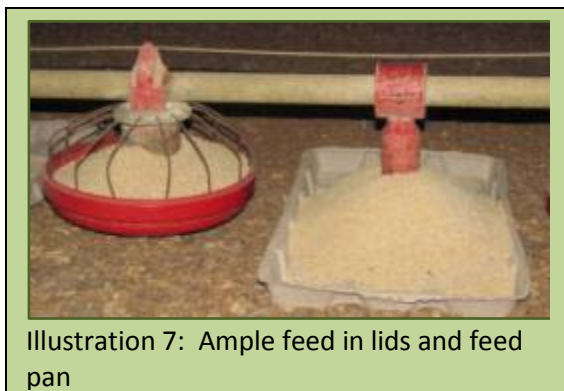
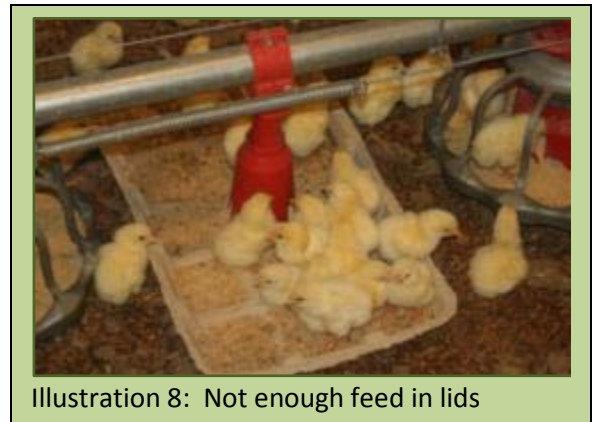


Illustration 7: Ample feed in lids and feed pan



This extra feed, along with proper brooding temperatures where the feed is located, attracts the chicks to the feed source immediately after placement. Depending on the brand and model of feeders, the extra feed should be maintained until birds begin to waste feed.

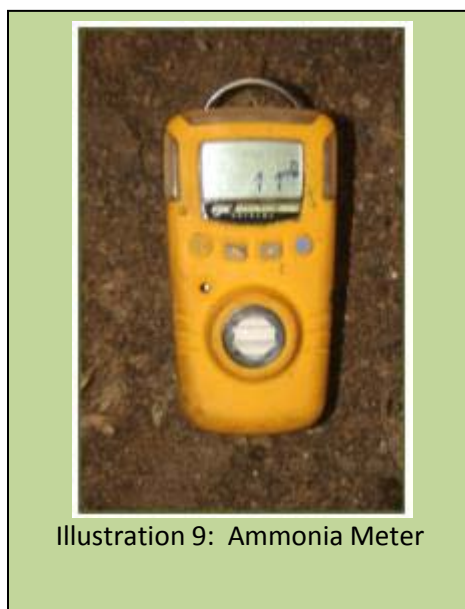
When the chicks are three to four days old, any feeder lids that are not under chick-mates may be removed. The remaining feeder lids should have fresh feed available at all times (Illustration 8). These lids may be removed over a three day period that ends on the day of turnout. Producers who take up the feeder lids too soon stress the baby chicks because of insufficient feeder space.



### **Air Quality**

Good air quality is important in the brooding phase. The heat from the brooders releases ammonia gas from the litter. High ammonia levels can cause irritation to the respiratory tract with subsequent harsh vaccine reaction and respiratory problems later in the flock. These same levels may create ammonia blindness in the chicks and impede the proper intake of feed and water with resulting low bird weights and poor uniformity. Ammonia levels should never exceed 25 ppm (Illustration 9).

Carbon dioxide (CO<sub>2</sub>) is produced by the burning of propane or natural gas and through respiration of the chicks. Excessive amounts of CO<sub>2</sub> can cause chicks to become sleepy and not move. Sleepy chicks will not go to feed and water, thus early intake of feed and water will be inhibited. Levels of CO<sub>2</sub> should not exceed 3000 ppm (Illustration 10). Proper ventilation rates will prevent excessive ammonia and CO<sub>2</sub> levels.



## **Lights**

New and retrofitted houses are more advanced today. These advancements include solid side walls or black curtains for energy savings and light control. In this environment, it is difficult for the chick to see feed and water if they are not provided with enough light intensity. In the absence of enough light, a perfect brooding set up would be insufficient because the birds could not see to eat or drink. The minimum light intensity in any brooding set-up should be at least 2.5 foot-candles at the outside water line at drinker height (Illustration 11).



Illustration 11: Bright lights in new house

## **Conclusion**

Extra care should be taken that the chicks do not go hungry or thirsty and that the birds do not get cold during this critical period of life. If the chick's immune system is healthy, disease organisms and vaccinations will stimulate protection and help prevent condemnations caused by air sac, Marek's disease, coccidiosis, inflammatory process, septicemia-toxemia, and gangrenous dermatitis. Raising chickens requires a lot of practical thinking. If something goes wrong, the chicks can't understand excuses.