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Poultry Housing Tips

Getting Chicks Off to a Good Start

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Birds, like other warm-blooded animals, try to maintain relatively constant body temperatures. Unlike mature birds, young chicks are not very good at maintaining a constant body temperature and as a result, their body temperature is affected by house temperature. In fact, a chick's ability to regulate its own body temperature (referred to as its thermoregulatory system) does not fully develop until about two weeks of age. Therefore, it is highly dependent upon the grower to provide the proper house temperature. If a house is too cold, a chick's body temperature will decrease, which can stunt its growth and/or make it more susceptible to disease. If the house is too hot, the chick's body temperature will rise, which can lead to dehydration problems.

The younger the chick, the less developed its thermoregulatory system. So as you might expect, a day-old bird is very susceptible to low house temperatures. Studies have shown that exposing a day-old chick to short periods of low air temperatures can have long term effects on bird performance causing significantly decreased body weight, higher feed conversion, and increased disease susceptibility .

To maximize bird performance, litter temperature should be approximately 85ºF when chicks are placed. **Litter temperature is critical, not air temperature**. A day old chick is about two inches in height. The temperature of the air within two inches of the floor is determined by the temperature of the litter. In houses that are not properly preheated it is not uncommon to find that the temperature of the floor is 10 degrees or more colder than the temperature of the air just a few feet above the floor. Even in the best of houses, floor temperature is usually two to three degrees below air temperature. To make matters worse, chicks can lose a significant amount of heat through their feet when they sit on a cold floor. So even though the house may feel hot, the birds may be cold because people and thermostats sense air temperature several feet off the floor and the birds are sensing floor temperature.

Another factor to consider when it comes to chick comfort is litter moisture level. Damp litter is colder than dry litter. A young chick sitting on a damp floor is essentially sitting on a large evaporative cooling pad. As the water evaporates from the litter, heat is removed from the litter, reducing its temperature. To minimize cold stress, litter should be protected from rain when stored. Preheating time should be doubled if the litter is damp when placed in a house.

Both brooders and furnaces can be used effectively to keep chicks warm; however, brooders typically do a better job of heating the floor than hot air furnaces. This is because a significant portion of the heat they put off is in the form of radiant heat. Radiant heat is basically sunshine. The sun can heat the ground outside a chicken house to above air temperature. Brooders can do the same, heating the temperature of the floor to forty degrees or more above ambient air temperature. Generally speaking, the amount the floor is heated is dependent upon how far you are from the brooder. The floor directly underneath a brooder can be 40 degrees higher than room temperature; a few feet from the brooder the floor may only be a couple of degrees above room air temperature. The distribution of heat is dependent upon the type of brooder used. Traditional hover style brooders only heat the floor within a few feet of the brooder. New radiant brooders can heat the floor up to eight feet from the brooder. The variation in floor temperature is a positive since this enables chicks to regulate their body temperature by moving closer to or farther from the brooder.

It is more difficult to get the floor warm in houses that use hot air furnaces. The hot air produced by a furnace quickly rises to the ceiling because this hot air is much lighter than the cooler air in the house. In houses with furnaces, a producer has to add enough hot air to the house so that it makes it down to floor level. In order to get a floor temperature of 85ºF, you may have to get the temperature of the air 4' off the floor to 90ºF or higher.

In houses with brooders, proper floor temperatures can usually be obtained by preheating the house to 85ºF for 24 hours prior to the placement of the birds. Houses with hot air furnaces should be preheated to 90ºF for 48 hours prior to bird placement. Preheating time can be reduced through the use of circulation fans. The circulation fans can be controlled by interval timers or thermostats. Thermostats can be placed near the peak of the ceiling and set at 95ºF so they only run when there is sufficient hot air collected near the ceiling to warrant their operation.

Care must be taken using circulation fans when there are chicks in the house. Young birds are very susceptible to drafts. Air speeds as slow as 100 ft/min (a little more than 1mph) can cause a significant windchill effect. If circulation fans are used, they should be directed toward the ceiling to minimize the possibility of chilling young birds.

When chicks arrive at the farm they tend to spread quickly over the entire brooding area even when litter temperature is not adequate. After an hour or two it becomes obvious if the temperature is correct. When chicks are warm and comfortable, their instinct is to huddle together in groups, then break from these groups and form new groups randomly. If the litter is cold or wet, the chicks will cool rapidly and cold chicks will remain in the same group of huddling chicks. They may search for warmer places and, if found, will remain there and not venture out to look for water or feed. This can lead to starve-outs and dehydration. On occasion they will venture out from the warmth of the group to look for feed, but they will require an increased amount of feed to keep them warm and comfortable.

Another good indicator if the house is properly heated is to check the temperature of a chick's feet. Place a chick's feet against your neck (your neck can sense temperature better than your hands which are thicker skinned and usually colder

to begin with). You will be surprised how cold a chick's feet can be and how it will correlate with their activity. If they are nice and warm, the chicks will usually be running around. If they are cold, the chicks will more likely huddle.

In addition to proper air temperature, proper air quality is also very important to the health of a young bird. Mature birds can tolerate moderate levels of ammonia. For instance, commercial layers can tolerate 60 ppm ammonia without a decrease in performance. Broilers on the other hand never reach physical maturity and as a result can be harmed by less than 25 ppm of ammonia. Just as is the case with air temperature, air quality has the biggest impact on a small bird. Short periods of high ammonia levels as those described above can lead to decreased weight, increased feed conversion and increased respiratory disease. Ammonia levels should be kept below 30 ppm at all times, and ideally below 20 ppm.

Poultry houses should be ventilated even before the arrival of chicks to minimize the buildup of ammonia, moisture, and combustion gases. A minimum ventilation rate of 0.1 cfm per bird is generally recommended. This ventilation rate may need to be increased if there is high ammonia or house humidity. As the birds grow, minimum ventilation rates should increase by the age of the birds in weeks multiplied by 0.1 cfm per bird. Adjustments may be needed due to variations in outside temperature and humidity as well as inside ammonia and dust levels.

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