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Poultry Housing Tips

Heating System Thermostat/Sensor Location

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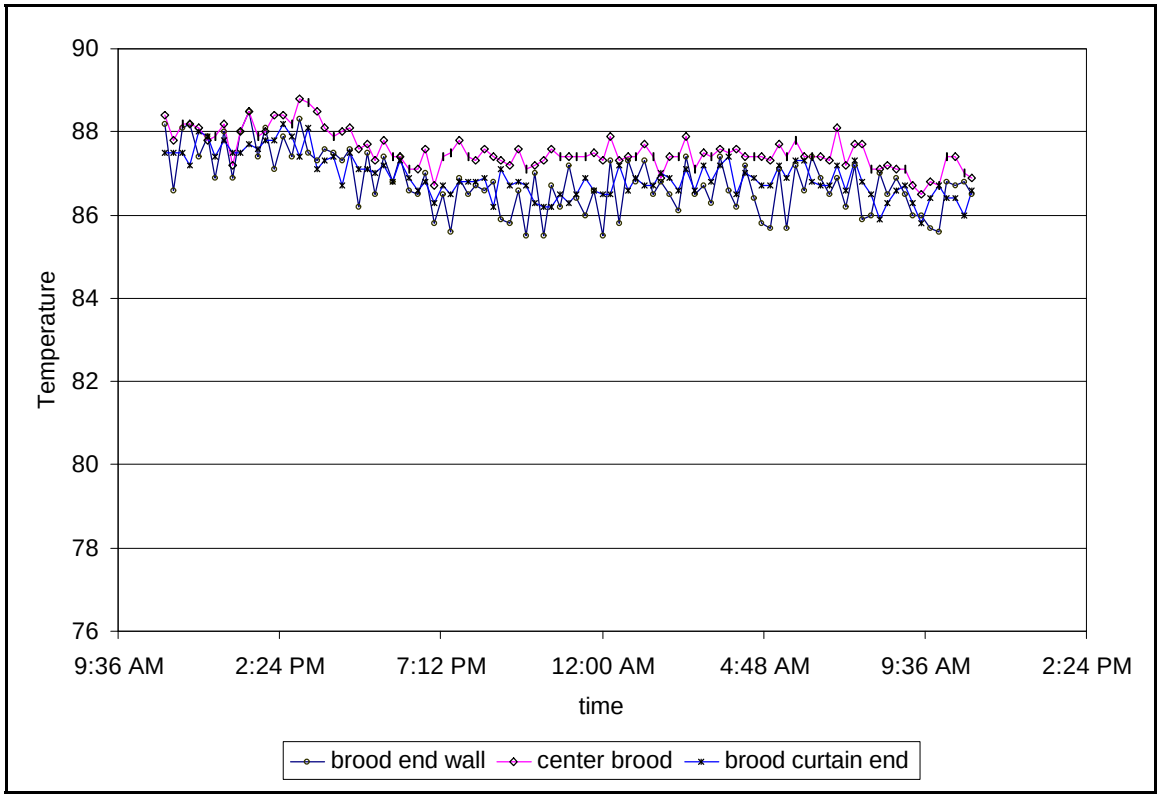

Figure 1. Brooding Chamber Temperatures 2.5 Feet Above Floor.

Your chicks are arriving in a couple of hours and you are making your final walk-through to make sure that everything is ready. You notice a light bulb is burned out so you grab a replacement bulb and a ladder. As you climb the ladder you notice the air near the ceiling is surprisingly hot (+100°F). You quickly replace the bulb so you can get back on the floor and the relative comfort of the 85 - 90°F air. But consider this, when you get off the ladder you are sensing the air temperature at a height of about five feet off the floor, not at floor level. There can be just as big a difference in air temperature between five feet off the floor and the temperature of the air right next to the floor as there is between five feet off the floor and the ceiling.

When brooding chicks you always have to be aware of the fact that the environmental conditions that you are sensing may be very different than those the chicks are experiencing. Just as important, you need to realize that the conditions your thermostats and/or controller sensors are sensing, located just a few feet above the floor, are often very different than those at chick level. This is primarily due to the fact that hot air is lighter than cold air. As a result, the hot air produced by brooders and furnaces collects at the ceiling and the cold air leaking in from cracks in the side wall collects at the floor.

The house in Figure 1 is a prime example of how conditions at chick level can be significantly different from those just a few feet above the floor. This particular house has three temperature sensors located approximately two and a half feet above the floor. One sensor is in the middle of the brood area, one is approximately 25' from the end wall and one is about 25' from the brooding curtain. The environmental controller uses these temperature sensors to determine whether the brooders should be turned on in respective areas of the house. According to the controller, the conditions appeared optimal for a young chick. But were they?

Even though the temperatures appeared adequate, chicks near the brooding curtain were huddling and appeared to be cold. A fourth temperature sensor was placed just below the brood curtain sensor (three inches above the floor) to determine why the chicks in this area of the house were uncomfortable. From Figure 2, it becomes clear why the chicks were cold. The temperature of the air next to the floor was only 80 degrees much of the time. The primary reason for the difference was the brooding curtain was too loose and a significant amount of cold air was drifting in from the rear of the house. Yes, the curtain should have been tighter. But, had the sensor been placed chick level, at least the brooders in this area of the house would have operated more and kept the chicks more comfortable.

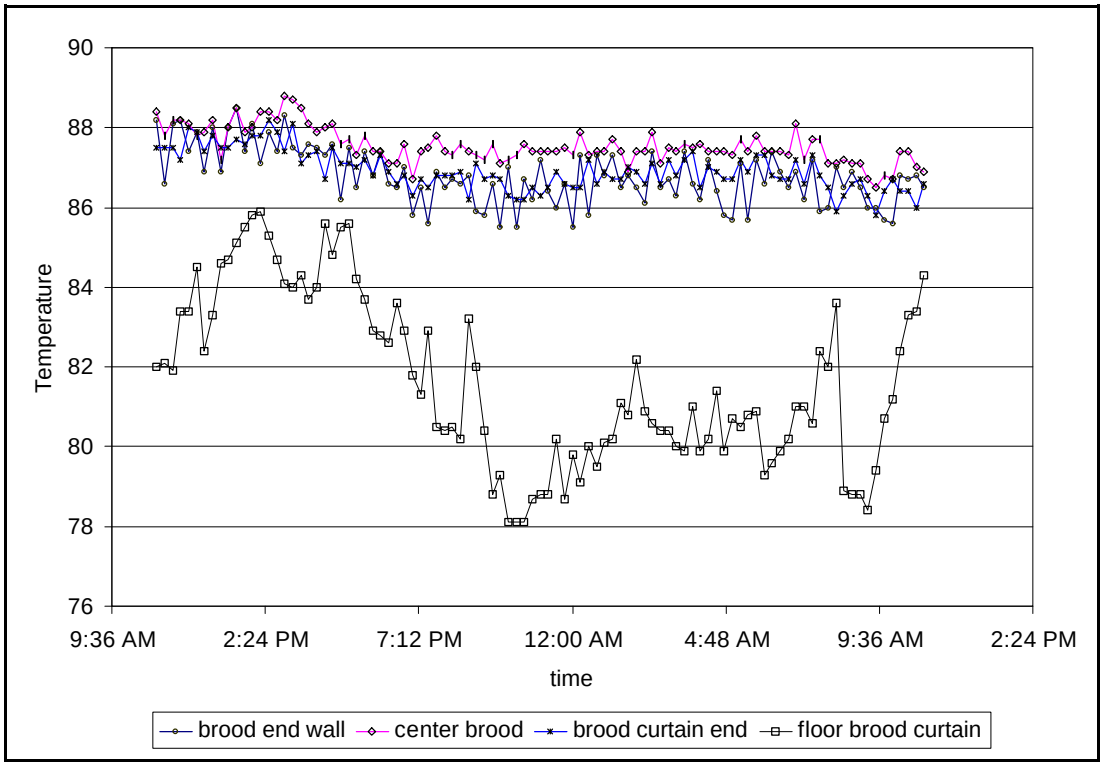

Figure 2. Brooding Chamber Temperatures 2.5 Feet Above Floor and at Floor Level

Measurements were made on a number of other farms, many of which did not have problems with loose brooding curtains, and similar temperature stratification problems were observed. On these farms the temperature of the air three feet above the floor was four to seven degrees warmer than at floor level. The amount of stratification depended on

how much the heating system was operating, house tightness, and location within the house.

You can see a potential problem here, many heater/brooder thermostats are placed two to three feet off the floor. The following scenario is common. A grower may want a house temperature of about 88°F. He sets his thermostats, located a few feet above the floor, at 86°F. Stratification and drafts will probably result in the temperature at floor level being at least five degrees cooler. As a result, he is actually brooding at closer to 80°F than 88°F.

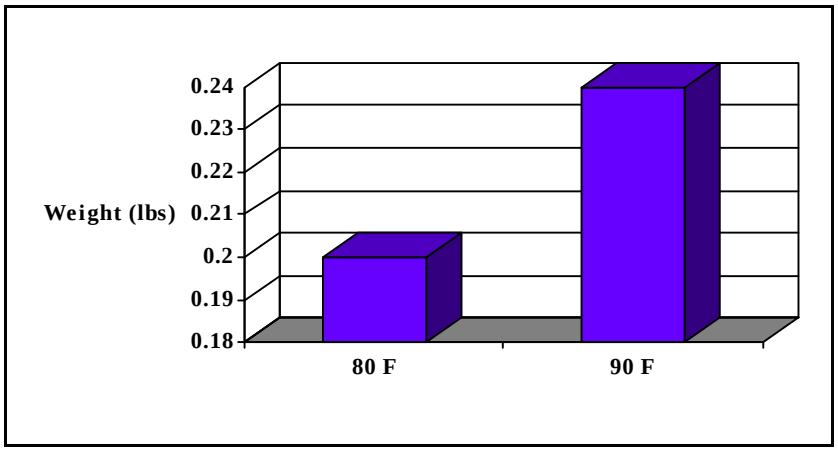

Figure 3. Weight vs. Brooding Temperature

This situation is especially troubling in houses with forced air furnaces. In houses with radiant or conventional brooders, the bird is warmed by both hot air and radiant heat emanating from the brooders. So, if the air is a little cool, chicks can move towards the brooders to receive more heat. But in houses with forced air furnaces, if the air temperature is too low, the only way the chicks can keep warm is by huddling. Of course huddling is not good; the more chicks huddle the less they feed, drink and grow.

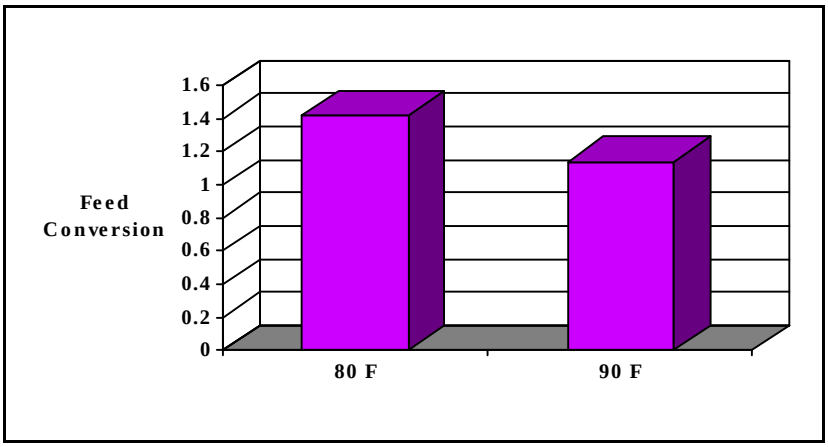

Figure 4. Feed conversion vs. Brooding Temperature

Brooding at 80°F instead of 88°F may not seem like much of a difference but it can have a dramatic effect on bird performance. A number of studies have shown that birds brooded at 80°F vs 90°F weighed as much as 20 percent less at ten days of age, had 10 percent higher feed conversion, and were far more likely to exhibit symptoms of ascites (water belly) (Figures 3, 4 & 5).

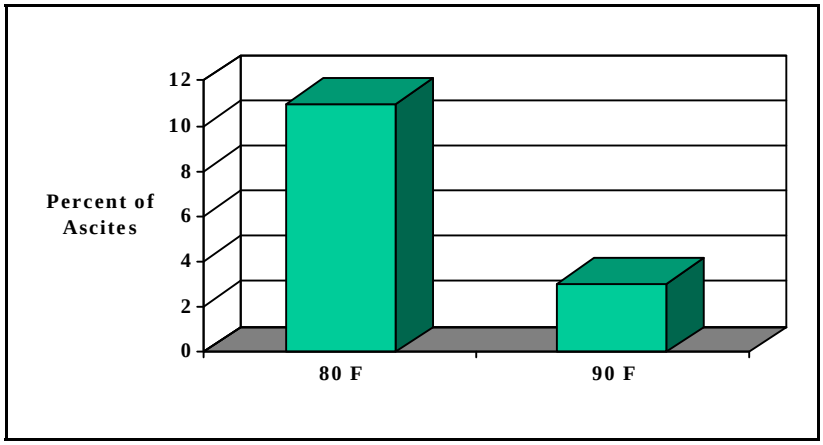

Figure 5. Percent Ascites vs. Brooding Temperature

The best way to insure that you are brooding at the proper temperature is to place thermostats/sensors three to four inches above the floor. This should be high enough that the chicks can not reach them. Once the birds are a week to ten days of age the thermostats/sensors should be raised a couple of feet off the floor so the birds cannot peck at thermostat/sensors or possibly sit on them leading to a potential disaster. By this time furnaces/brooders are not operating as much, so stratification is not as much of a problem. At older ages the birds are little less sensitive to low house air temperatures as well

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