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Poultry Housing Tips

The Importance of Uniform Bird Distribution During Cold Weather

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In houses with clear curtains, getting the birds to spread-out evenly after turning out from half house for the most part is not very difficult. Just a couple of sunny days, with the resulting high light intensity in the house, and the chicks are running around and have soon evenly distributed themselves throughout the house. In a totally enclosed house or one with black curtains, the situation is much different. Even with the lights at full intensity, light levels are often 100 times lower than what is experienced in the typical conventional clear curtain house. The lower light levels dramatically reduce bird activity which results in a significantly longer time for the birds to spread out. Many producers are on light restriction programs which both reduce the level of light and number of hours of light a day right around the time the birds are turned out into full house and these factors may slow down distribution even more. The challenge for producers is that if the birds are not evenly distributed by three to four weeks of age, they most likely never will be. This may adversely affect broiler performance and also heating costs.

In order to optimize weight gain and feed conversion, it is very important that uniform densities be maintained. Numerous studies have shown that as bird density increases, bird performance decreases. For instance, a study conducted at Auburn University showed that just increasing the density from 0.9 square feet per bird to 0.8 square feet per bird decreased bird weight from 5.88 lbs. to 5.77 lbs. and increased feed conversions from 1.85 to 1.88 lbs. feed/lbs. of gain. When birds are not uniformly distributed after half house brooding density, differences such as these are common and often greater. As a result, the birds on the brooding end have lower weights and higher feed conversion while those on the nonbrooding end have higher weights and lower feed conversions. The problem of course is there are more birds on the brooding end than on the nonbrooding end.

What many producers do not realize is bird density differences can also affect heating costs. As birds digest feed heat is produced. The greater the amount of feed consumed the greater the amount of heat produced. Obviously, during the first couple weeks of a birds life the amount of feed consumed and therefore heat produced is fairly low, and producers have to rely heavily on their heating system to keep the house at the proper temperature. But, as the birds get older the amount of heat they produce becomes more and more significant. For instance, 23,000 three-week-old birds produce the same amount of heat as six conventional pancake brooders and the same number of four-week-old birds produce the same amount of heat as ten conventional brooders (Table 1).

If birds are not uniformly distributed, it becomes very difficult to take full advantage of the heat the birds are producing. The reason for this is that in a sense you are running more brooders/heaters on one end of a house than the other. You have a surplus of heat on one end and a deficit on the other, which results in one end of a house becoming too warm, while the opposite end is too cool. The furnaces or brooders on the nonbrooding end of the house will run much more than they should simply because the birds are not evenly distributed throughout the house. In a worse case

scenario, exhaust fans may come on to cool the brooding end of the house while the furnaces/brooders will be trying to heat the nonbrooding end of the house.

Bird Age (weeks)	Heat production (Btu's/hr)	Equivalent number of conventional pancake brooders	Equivalent gallons of propane per day
1	35,000	1	9
2	88,750	3	22
3	183,750	6	46
4	303,750	10	76
5	432,500	14	108
6	602,500	20	150
7	778,750	25	195

Table 1. Heat Production of 23,000 Broilers

Figure 1 illustrates a case where the birds were not evenly distributed after turnout. On this particular farm the birds were turned out into the full house on January 25th at ten days of age. For the next two weeks (pictured in Figure 1) the nonbrooding end was almost always below the desired temperature while the brooding end was above the desired temperature. This of course led to the heating system running significantly more on the nonbrooding end than the brooding end. It also can easily be seen from this graph how likely it would be for the fans to be running to cool off the house while heaters on the opposite end of the house would be running to maintain the proper temperature in that area of the house. For instance, most producers set their houses up so that if the temperature drops a couple of degrees below desired temperature the brooders/furnaces will turn on. Likewise, they will set timer fan thermostats a couple of degrees above desired temperature. In Figure 1, it can be seen that the temperature on the brooding end was at times five degrees above the set point, which would cause the exhaust fans to operate, while at the same time the temperature on the nonbrooding end of the house was two to three degrees below the set temperature, which would cause the brooders/furnaces to come on.

Figure 2. is from a second farm during the same time period with the same age birds, where the grower made a conscious effort to make sure the birds were spread out evenly shortly after turnout. Though there was variation in house temperature from day to day, temperatures on the brooding and nonbrooding ends of the house were much more similar than on the farm in Figure 1.

What about fuel usage? Figures 3 and 4 illustrate the number of minutes the heating system operated on one of the houses on each of the two farms over a three-day period. The heating systems on both farms are divided up into four zones, three on the brooding end and one on the nonbrooding end. The controller on each farm keeps up with the number of minutes each zone runs each day. Though there were only slight differences in set temperatures and heating system offsets between the two farms, the difference in heating system run time was dramatic. On the farm where the birds were not spread out, it can be seen that the heating zones near the tunnel curtain and the center of the brooding area ran very little if at all during the three days studied, while the zones near the nonbrooding end and in the nonbrooding end of the house ran for a significant amount of time each day. In the house where the birds were spread out, not only was significantly less supplemental heat required, but when it was needed, the heating zones ran about the same amount of time.

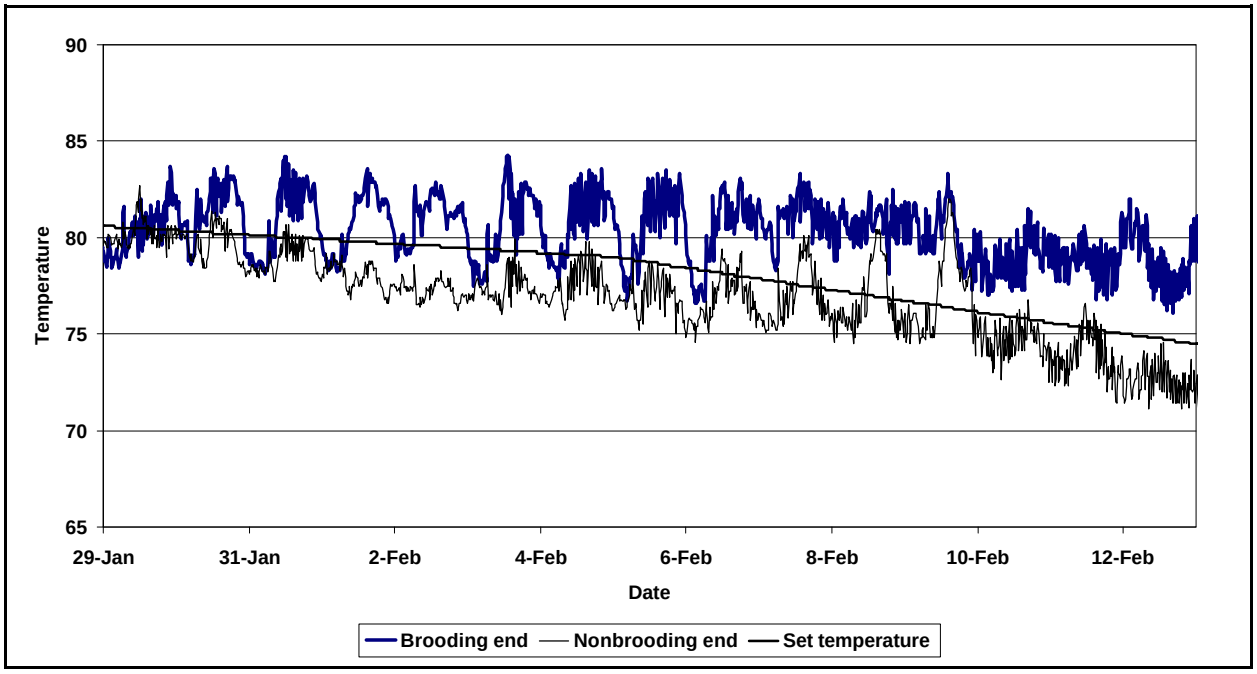

Figure 1. Temperatures in house with uneven birds

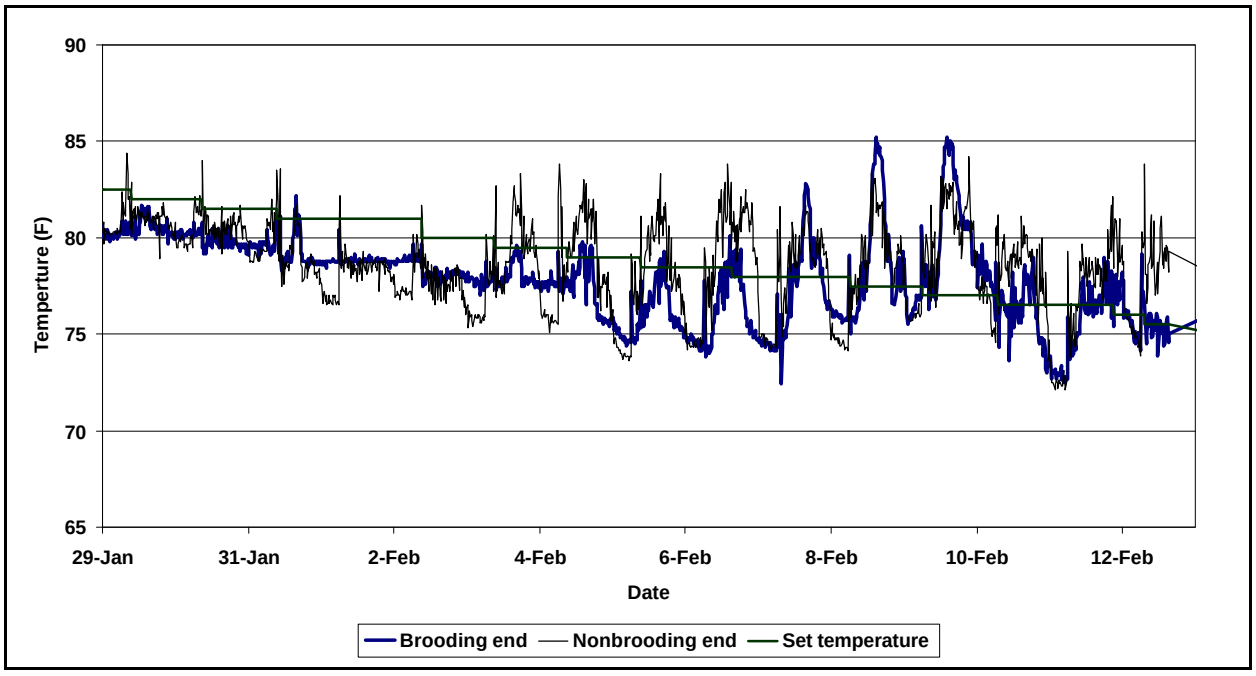

Figure 2. Temperatures in house with birds evenly spread out

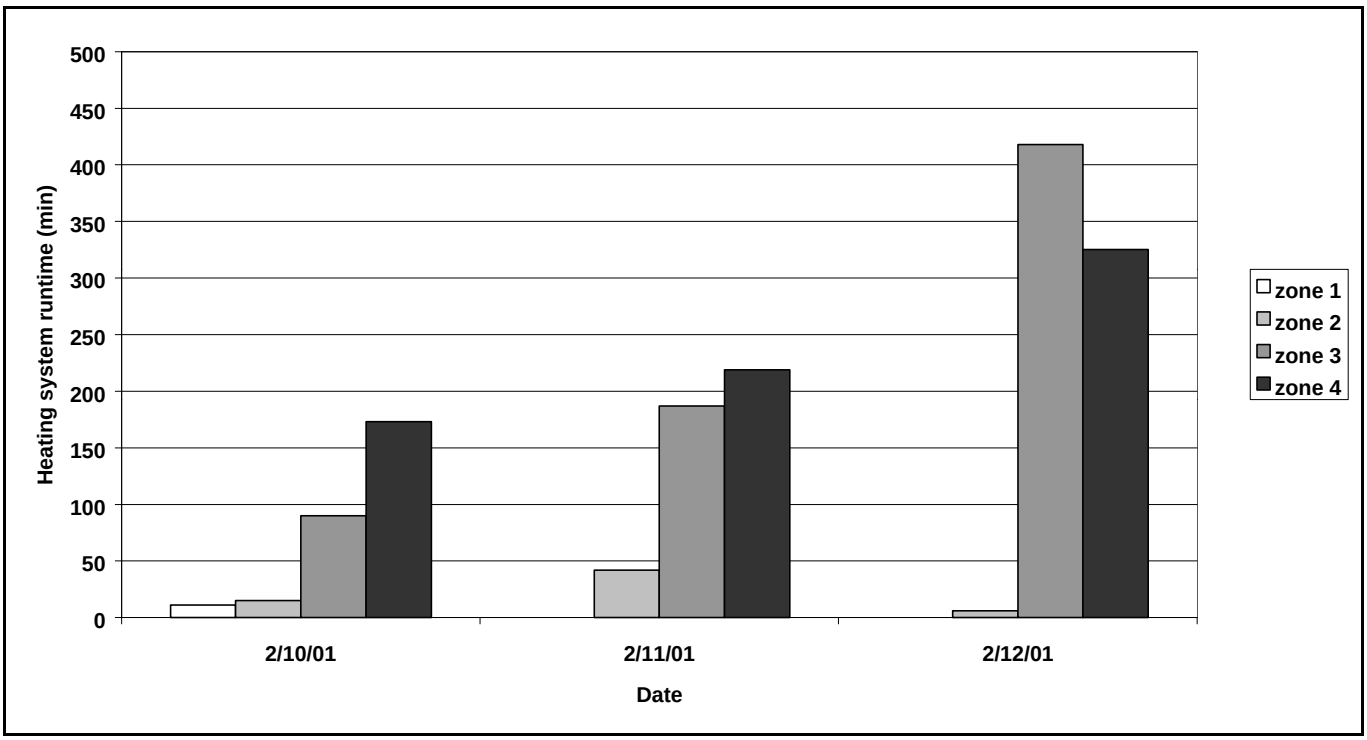

Figure 3. Heating system run time by zone (uneven birds)

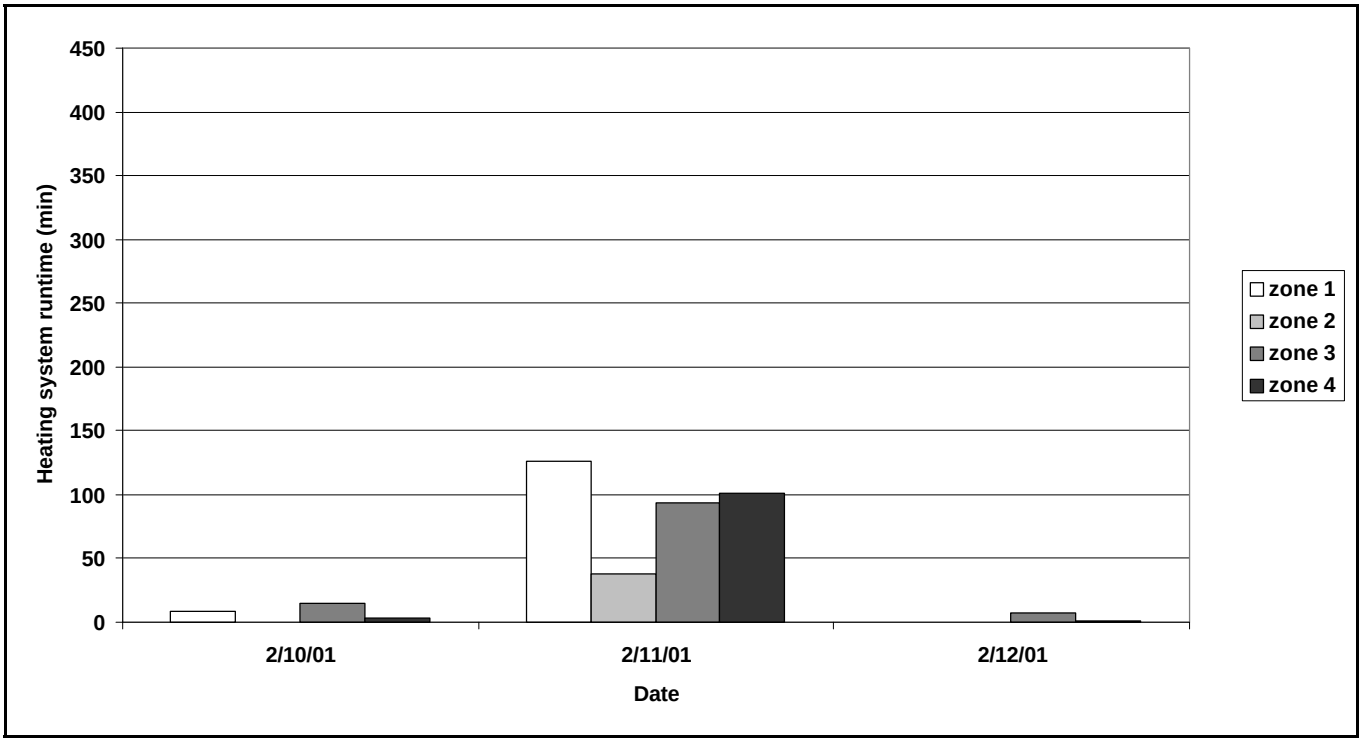

Figure 4. Heating system run time by zone (birds evenly spread out)

As you can see, making sure your birds are evenly spread out after half house brooding is one of the best ways of increasing bird performance and decreasing fuel usage at the same time. The following are some management tips that should help growers get and keep birds evenly distributed throughout the house:

1) Preheat the nonbrooding end of the house for at least a couple of days prior to turnout.
2) Do not open all the inlets on the nonbrooding end of the house until the birds are evenly distributed throughout the house.
3) If after a few days birds have not spread out, gently drive them to the rear of the house.
4) Pay special attention to the area near the tunnel curtain because this is typically an area of high bird density.
5) Put up migration fences year round to make sure the birds stay evenly distributed.
6) During cold weather, cover some of the 48" fans with plastic to reduce leakage through the fan shutters which tends to make the area near the feed control pan very cold making it very difficult to get the birds to spread out into this area of the house.

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