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Poultry Housing Tips

The Importance of Having the Proper Gas Pressure

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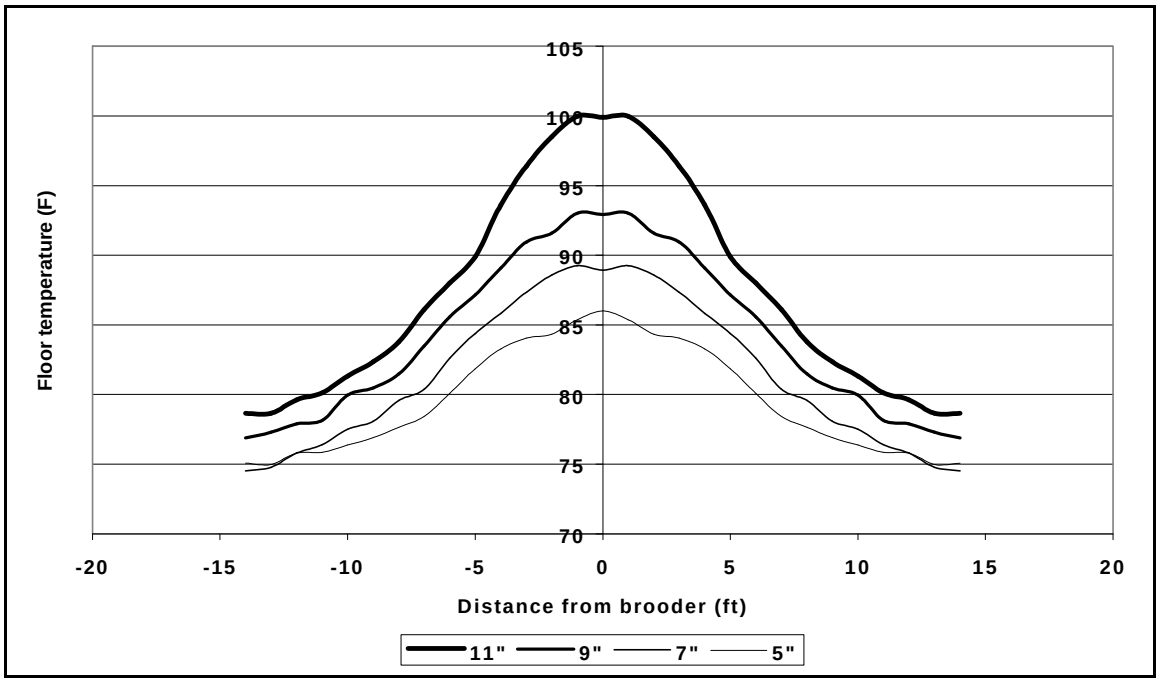

Figure 1. Gas pressure vs. radiant heat

When you have young chicks and the outside temperature drops down to the 20's or 30's, do you have difficulty maintaining the proper house air temperature even though your brooders are operating constantly? It could be that your house is loose, ceiling insulation needs to be increased, or you are having to ventilate a lot because there is too much ammonia. However, another possibility is that you have insufficient gas pressure.

In general, gas pressure determines the amount of gas that flows to a brooder/furnace. The higher the gas pressure, the greater the amount of fuel burned by the brooder/furnace, and the greater the amount of heat produced by the brooder/furnace. And of course the opposite is true...lower pressure, less gas, less heat.

Each brooder/furnace is designed to operate most efficiently at a specific gas pressure. When the gas pressure is too low not only do you not get enough heat, but you may not get complete gas combustion resulting in the production of carbon monoxide. Conversely, if the pressure is too high, the brooder could get too hot resulting in reduced brooder/furnace life. Though it is possible to have too much gas pressure, low gas pressure is a more common

occurrence.

Recent tests of radiant brooders at the University of Georgia have shown that relatively small drops in gas pressure can have a significant effect on the amount of heat radiant brooders produce. In the study, a radiant brooder was placed in a 75°F room at a height of 6 feet above the floor. Gas pressure to the brooder was set according to manufacturer's specifications (11" of water column for propane). Ping pong balls were placed on the floor to simulate chicks and were spaced various distances from the brooder to provide a realistic method of measuring the radiant heat a chick would receive from the brooder. After 45 minutes "chick" temperatures were measured using an infrared thermometer. Gas pressure was then incrementally reduced to 9", 7" and 5" and "chick" temperature measurements were repeated.

Figure 1 shows how the amount of radiant heat produced by the brooder decreased as the amount of gas pressure to the brooder was reduced. Reducing gas pressure from 11" to 9" reduced radiant heat output from the brooder by approximately 13%. When gas pressure was reduced from 11" to 7" radiant heat output was reduced by 30%. Finally, when gas pressure was reduced from 11" to 5" radiant heat output was reduced by nearly 40%!

In addition to producing less radiant heat when gas pressure is reduced, a brooder would also produce less hot air which of course would lower house air temperature. This phenomena was seen on a farm in West Georgia this winter where house temperatures were being monitored. Temperature graphs from the farm indicated that as long as outside temperatures stayed above 30°F, the producer had no difficulty in maintaining proper brooding temperatures. But, when outside temperature dropped in the twenties, house temperature would drop. The more outside temperature dropped, the cooler the house became.

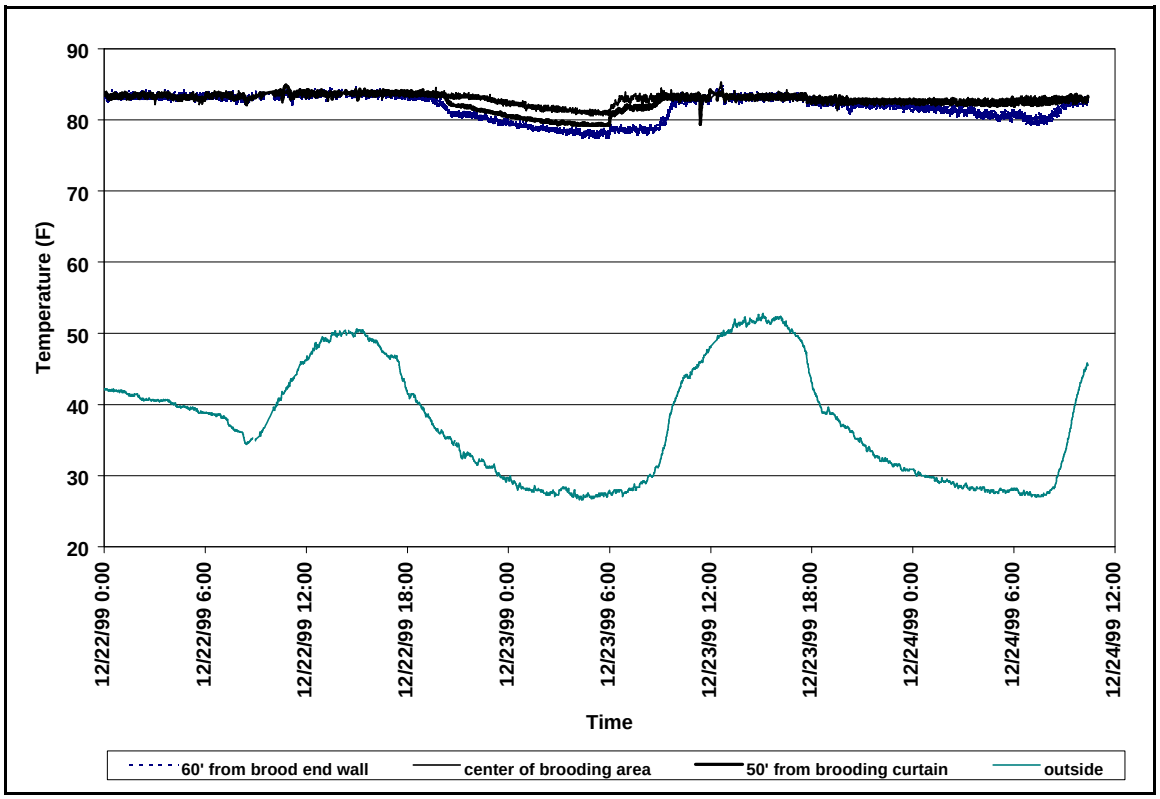

Figure 2. House air temperatures in house with low gas pressure

When searching for the source of the problem, brooder gas pressure was checked and was found to be low. On this particular farm, natural

gas was being used as the fuel source. The manufacturer of the brooder specified 7" of water column of pressure for natural gas but pressure was found to be approximately 5". Adjustments to gas pressure regulators were made to bring the pressure up to standard. After adjustments were made, the radiant brooders began to glow brighter and the house temperature began to rise.

Figure 2. shows how changing gas pressure affected house temperature. During the night of December 23 the house temperature dropped significantly below the desired 84°F. The problem with insufficient gas pressure was discovered and subsequently increased at approximately 1 p.m. on December 23. The following night the producer was able to do a much better job of maintaining a temperature of 85°F with the exception of area near the half house curtain where excessive air leakage from around the curtain resulted in lower than desired air temperature.

As you can see, having a low gas pressure hurts a producer in two ways; it reduces the amount of radiant heat a brooder produces as well as the amount of hot air it produces both of which are very important in keeping chicks warm during cold weather. Improper gas pressure not only affects heat output but also gas usage. Furnaces/brooders burn fuel most efficiently when gas pressure is adjusted correctly. It is important to note that low gas pressure will also affect the heat output of conventional and forced air furnaces as well.

If you think that you may have a gas pressure problem check with the manufacturer of the brooder/furnaces on proper procedure for checking gas pressure as well as information on possible causes of low gas pressure (i.e, proper gas line sizing). Then with this information in hand call your local gas company/equipment installer to set up a time for them to check your gas pressure. It is very important that you make sure they follow the brooder/furnace manufacturers procedure on checking gas pressure (i.e., gas pressure needs to be checked at the last brooder/furnace on the gas line with all brooders/furnaces operating).

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