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Poultry Housing Tips

Migration Fences Should be Used During Cold Weather

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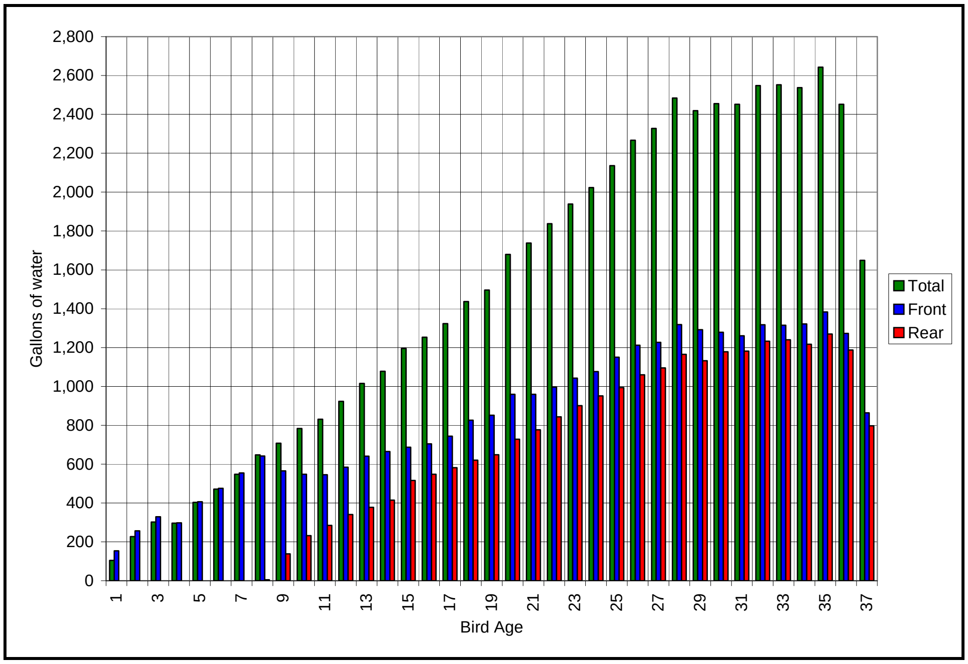

Figure 1. Daily total water consumption for the whole, front and rear of a commercial broiler house.

Maintaining uniform bird density throughout the broiler house is important year round. Most producers are conscious about putting up migration fences during hot weather when bird migration generally can lead to significant variations in bird density between the fan and inlet ends of a tunnel-ventilated house. However, the use of migration fences is not the norm during the winter months. Even though bird migration may not be as dramatic in cold weather, if birds are not distributed evenly, it can be very costly, possibly more costly than during hot weather. This is because during cold weather uneven bird distribution affects bird performance and heating costs as well.

House feeder and watering systems are designed to meet the needs of the birds during the last days of growout when birds are at their biggest. However, the feeder and drinker to bird ratios assume that birds are distributed evenly throughout the house. If the number of birds increase in a certain area of the house, there will be more competition for feed and water and birds may be feed and water restricted. One might think the problems end there, but the difference in bird size between the front and rear of the house can result in problems at the processing plant. Companies are growing broilers to a particular size to meet a specific customer demand, and as a result, the equipment in the processing plant is adjusted for an exact bird size. Increases or decreases in bird size can result in insufficient feather removal, increased carcass contamination, more carcass defects such as torn skin and broken wings and reduced meat yield.

If bird distribution differs in the house, heat load in the broiler house becomes uneven, with the area of the house with too many birds having too much heat while the area of the house with too few birds will be in a heat deficit resulting in the heating system running significantly longer to compensate for the difference. Not only does the heating system run more, but the birds will consume more feed to keep warm rather than for growth. That means poor feed conversion and high fuel bills.

For the last two years, Extension engineers and poultry scientists have been conducting a study on bird weighing systems and the factors that affect their accuracy. The test house is a 50' X 500' modern tunnel-ventilated broiler house that grows a 4.5 pound bird. The house is equipped with six bird weighing platforms equally spaced down the length of the house. The house is also equipped with a modern electronic environmental controller that monitors not only house conditions but heating system run time, water consumption and feed consumption. Last winter a flock was raised in February and March during a time of cold outside temperatures and during the part of the year that many producers may not necessarily pay a lot of attention to migration fences.

Figure 1 illustrates total water consumption and the amount of water consumed on each end of the house during this cold weather flock. Though the birds were turned out into full house at nine days of age, they really were never evenly distributed down the length of the house. Seven days after the birds were turned out there was still a 20% difference in water consumption between the two ends of the house indicating that there was a 20% difference in density between the two ends of the house. A migration fence was placed at half house on day 15 and from day 15 to day 25 there were not any drastic changes in the difference of water consumption between the front and rear of the house but in the last week the water consumption became more uniform. Though water consumption tended to even out towards the end of the flock there was still over a 10% difference in water consumption between the two ends of the house.

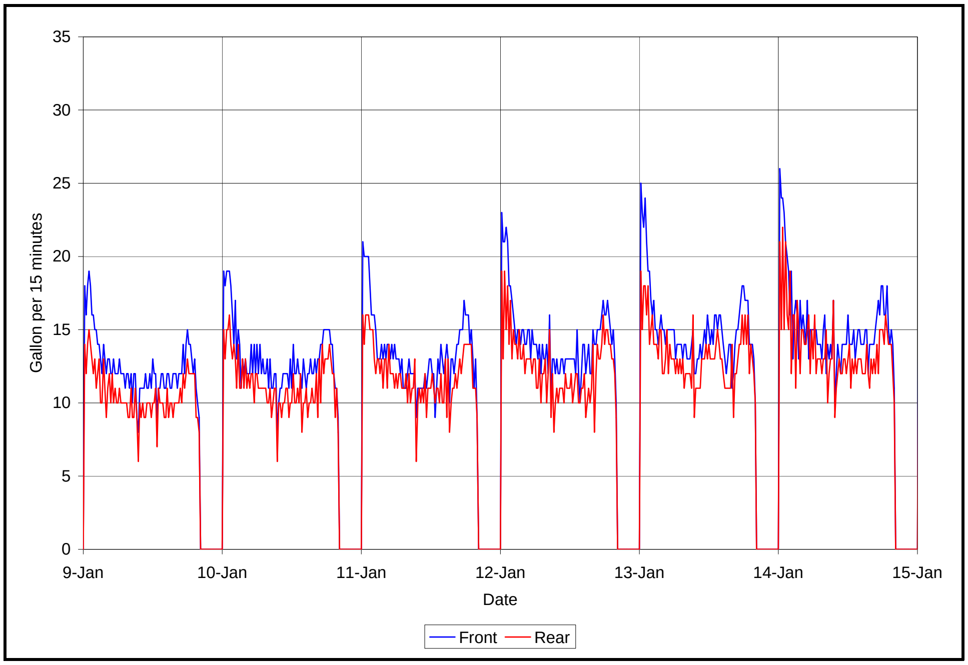

Figure 2. 15 minute water consumption on each end of the house.

Water consumption is tied directly to feed consumption and bigger birds consume more feed due to higher nutrient demands than smaller birds. Therefore, instead of bird migration being the explanation of why the difference in water consumption between the front and rear of the house was less, it is more likely due to the birds in the rear being bigger than those in the front. Big birds have higher nutrient demands than smaller birds and as a result will consume more feed and water. In short, even though there were fewer birds in the back of the house, they were larger and as a result drank more water.

Another indicator that birds on the brooding end were more crowded than those on the nonbrooding end can be seen in the graph of 15 minute water consumption of the front and back house when the birds were approximately three weeks old. The birds were on a restricted lighting program where the lights were turned off between the hours of 10:00 pm and midnight. As would be expected when the lights did come on at midnight there was a peak in water consumption as birds got up and ate feed and drank water. An interesting observation is the 25% lower peak associated with water consumption in the rear of the house, indicating that there was a significantly larger number of birds on the brooding end than on the nonbrooding end.

The final indicator of a bird density difference during this flock was the house temperature. As the birds got older and were producing more heat it became clear that there were more birds on the brooding end than the nonbrooding end. In Figure 3 during the same time period pictured in Figure 2, the average of all the sensors on the brooding end was running between two and three degrees above the desired temperature while the average of the three sensors on the nonbrooding end ran one to two degrees below the set temperature. Basically, the temperature graph indicates that there is a surplus of heat on the brooding end of the house and a deficit of heat on the nonbrooding end. As you might expect, this resulted in a significant difference in fuel usage between the two ends of the house (Figure 4). Had the birds been more uniformly distributed, the heat the birds produced would have been evenly distributed resulting in more uniform house temperatures and lower fuel usage.

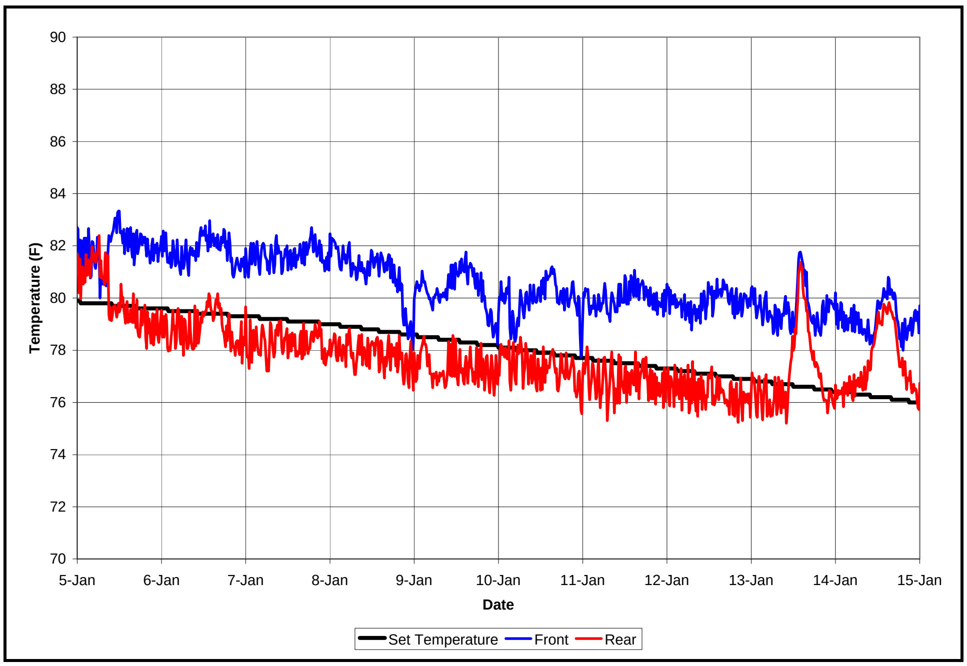

Figure 3. Average temperature on the brooding and nonbrooding ends of the house.

The daily body weight gain in Figure 5 shows that weight began to differ between the front and back of the house around 26 days of age. The weight gain in the front of the house plateaued towards the end of the flock. Birds in the rear of the house continued to experience weight gain up through the end of the flock. Birds in the middle of the house exhibited more growth than those in the front but not as much as those in the rear. Bird body weights shown in Figure 5 indicate that the birds in the rear of the house weighed the heaviest while the birds in the front of the house were smaller. Actually the density problems were worse than the water meters indicated. It is important to note that the two water meters don't necessarily paint a totally clear picture of bird density because there are often differences in density on each end of the house. On the brooding end, birds are often at a higher density up near the end wall than they are near the half house curtain. While on the nonbrooding end, birds may be a little less dense near the tunnel fan end wall than towards the half house curtain. As a result, even though there may be only a 10 or 20% density difference between the front and back halves of the house there may be a 20 or 40% difference between the fan and inlet ends of the brooding or nonbrooding areas of the house. Feeder space is designed for a uniform bird distribution in the last days of growout. Bird distribution is most critical in the last week of growout due to the heat removal demands and access to feed and drinker space.

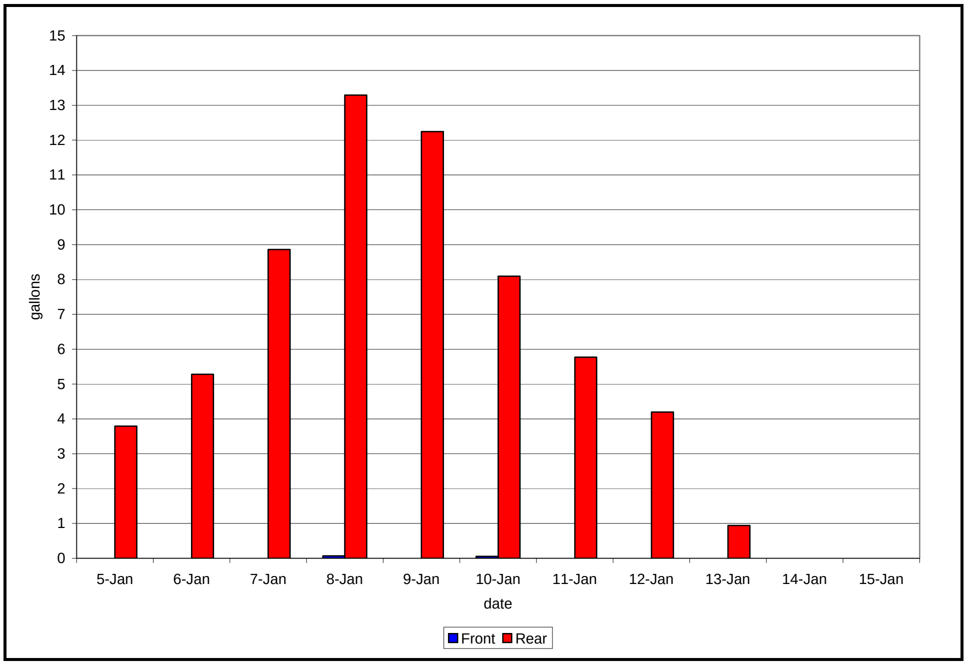

Figure 4. Daily fuel usage on the brooding and nonbrooding ends of the house.

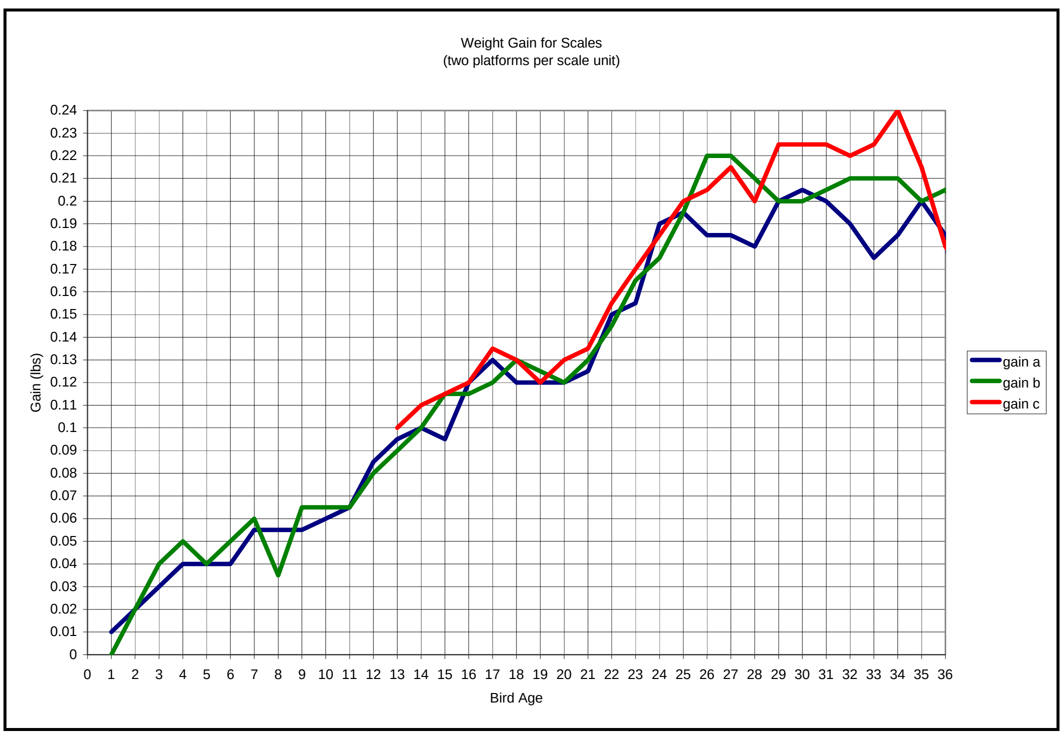

Figure 5. Average weight gain for the front (a), middle (b), and rear (c) of the house.

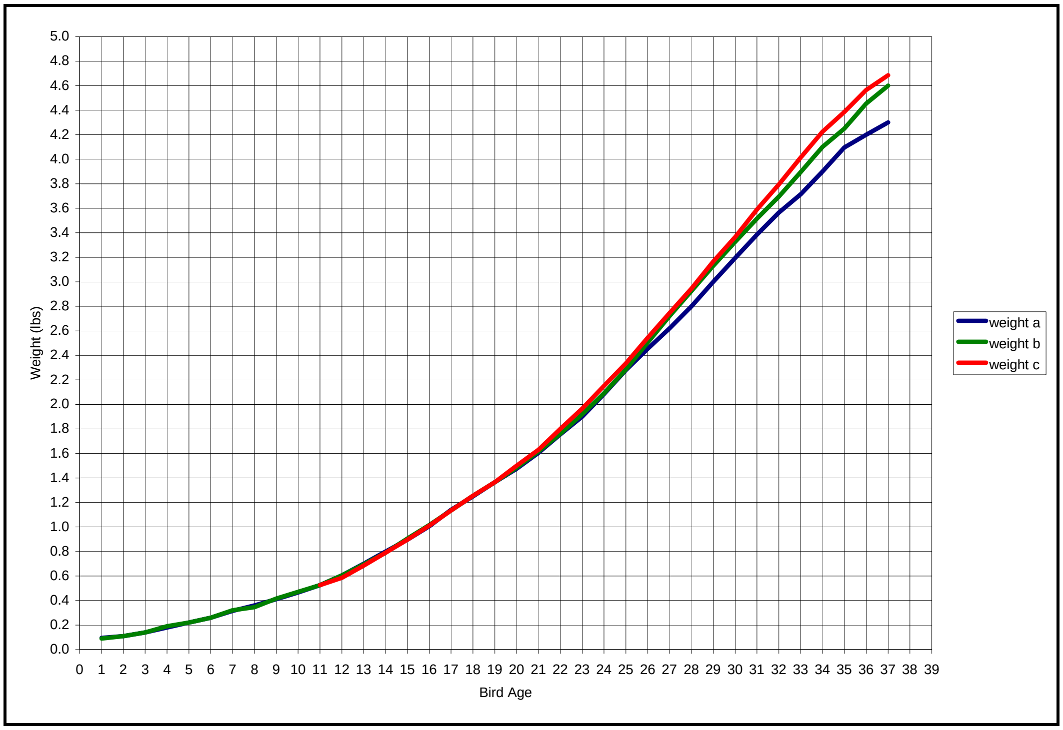

Figure 6. Average bird weight for the front (a), middle (b) and rear (c), of the house

While the use of migration fences originated as a result of bird migration during hot weather, it is important to use them all year long. Installing water meters to monitor water consumption in the front and back of the house will help producers ensure that birds are evenly distributed between the front and the back of the houses. Not only will this improve bird body weight uniformity, but it can prevent excess fuel usage.

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