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Poultry Housing Tips

Summertime Floor Air Temperatures

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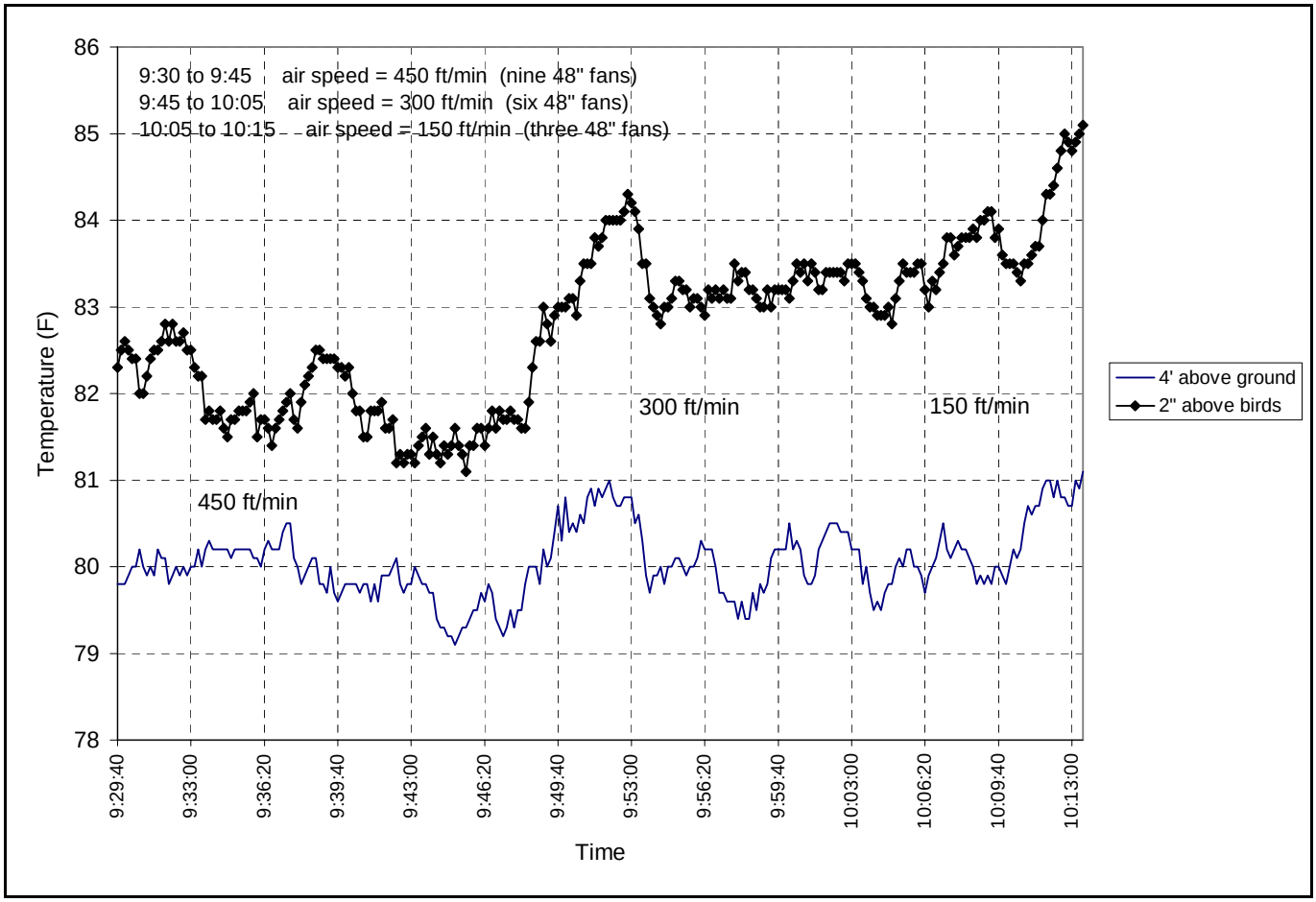
During cold weather, hot air produced by furnaces, brooders and birds rises toward and collects at the ceiling. As a result, the air near the ceiling will often be 5ºF to 20ºF warmer than the air near the floor. The accumulation of this hot air near the ceiling makes it difficult to keep the birds warm, the litter dry and fuel costs low. It may be hard to believe but during the summer the problem most growers face is not the accumulation of hot air near the ceiling, but rather, the accumulation of hot air between the birds on the floor.



Heat is produced as a bird digests feed. The larger the bird, the more feed it eats, and the more heat it produces. In fact, a house full of six pound birds produces almost three quarters of a million BTU's of heat each hour (This is about the same amount of heat that is produced by 20 pancake brooders). Most of the heat produced by a bird is given off to the surrounding air causing the temperature of the air near the bird to increase. The degree to which the air is warmed depends on the density of the birds and the amount of air movement. If the birds are widely spaced and there is a lot of air movement, the heated air is quickly removed from around the bird and the air near the bird stays relatively cool. However, if the birds are relatively large, sitting close together and air movement is minimal, the air between the birds can become significantly warmer than the air just a few feet above the floor.

Recently a study was conducted in a 40' X 500' tunnel-ventilated broiler house with seven-week-old birds to see just how much of an effect air movement has on the temperature of the air near the birds. Temperature measurements were taken a couple of inches above the birds (measurement taken with birds sitting) and four feet off the floor with different amounts of air movement. The amount of air movement was varied by changing the number of exhaust fans operating.

As expected, increased air movement (wind speed) reduced the amount of hot air trapped between the birds. With 450 ft/min air speed there was only a two degree difference between the air temperature near the birds and that four feet off the floor. With 300 ft/min air speed the difference increased to three degrees. When air speed was decreased to 150 ft/min the difference increased to approximately four degrees. If the air speed had dropped to 50 ft/min or less (i.e., a naturally-ventilated house on a still night), field measurements have shown that the air temperature near the floor could have been six degrees or more warmer than the temperature of the air three to four feet off the floor.

There are a number of instances where the insufficient air movement can lead to the build up of heat between the birds and a increased likelihood of production problems:

a) If a tunnel-ventilated house does not have enough exhaust fans, not only will the amount of windchill effect be limited but the producers ability to remove heat from between the birds will be reduced.

b) When a grower switches from tunnel to natural ventilation at night the environment of the birds can be a lot warmer than expected. For instance, many broiler producers switch from tunnel to natural ventilation when outside temperature approaches 70^{o}F. In a naturally-ventilated house with big birds the air inside the house is typically five to ten degrees warmer than the air outside (75 to 80^{o}F). Since there will probably be minimal air movement in the house the air near the floor could be four degrees warmer or more than the air a few feet above the floor. The end result is that the air down where the birds are may be as warm as 79 to 84^{o}F.

c) Growers with big birds who do not run their circulation fans on warm summer nights may be keeping their birds a lot warmer than they think. As in the above example, floor air temperatures could be very warm even though it is fairly comfortable outside.

d) During hot weather growers with big birds in tunnel-ventilated houses may need to run a couple more fans at night to insure that sufficient heat is drawn off their birds.

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