

Good ventilation takes good management

NEWARK, Del. — Local broiler companies report that fuel consumption in the first three weeks of January was 1.68 times higher than it was in December based on gallons per 1,000 birds marketed, says E.W. Walpole, Extension agricultural engineer with the University of Delaware.

The severe winter is the obvious cause, but Walpole suggests that harsh weather only magnifies the benefits of good management and the penalties of poor management. This is especially true in relation to operating a ventilation system.

Ventilation is the controlled exchange of polluted pen air with clean outside air. The pollutants produced in a broiler house are carbon dioxide, ammonia, water vapor, and some others in minor quantities.

"Ammonia and water vapor are the most troublesome and determine the required ventilation rate," says Walpole. "If you ventilate to keep ammonia at a safe level and keep the litter moist but not wet, you'll automatically take care of the carbon dioxide and minor pollutants."

The other part of the picture is the fresh air coming in. For each amount of polluted air that is removed, an equal amount of cold

fresh air comes in to replace it. The fresh air must be heated up to the desired pen temperature and this takes fuel. This is particularly expensive when starting and this takes fuel. This is particularly expensive when starting new chicks that need 90 degree Fahrenheit temperature during extremely cold weather.

If you're ventilating new chicks at 0.1 cubic feet per minute per bird, or 100 cfm per 1,000 birds, when the average outside temperature is 20 degrees Fahrenheit, it will take about 13.5 gallons of LP gas worth about \$10 just to warm up the incoming air for the first week. For a 20,000 bird house this becomes 270 gallons worth \$200.

And if you're ventilating at .3 cfm per bird, the numbers become 810 gallons worth \$600. This isn't your total fuel cost—just that portion due to ventilation.

The main point, according to Walpole, is this. If you're ventilating your 20,000 bird house at .3 cfm per bird when .2 cfm would be adequate, you're wasting \$200 worth of fuel, or adding one cent to the cost of producing each bird. To your contracting company, the addition of one cent per bird to the cost of production represents a lot of money.

Overventilation wastes fuel! This is where management enters the picture.

A good manager knows how old the litter is and realizes that older litter produces more ammonia. He uses his nose to measure the ammonia level. If the ammonia smell hits you as soon as you open the door, it's too high. What he wants is the condition where he can just barely smell it. A good manager will adjust the ventilation rate to the lowest level that will provide adequate control.

A good manager also knows that as he lowers pen temperature, the amount of ammonia produced will decrease. He may be able to reduce the ventilation rate slightly in the second week. By the third or fourth week, he should be following the normal ventilation rate for moisture removal. From then on he watches litter conditions to evaluate moisture conditions in the house. If the litter is dry and dusty, he reduces the ventilation rate; if it's getting wet, he increases ventilation.

"Ventilation is more than rate, it's a system," says Walpole. Fans and their controls determine the rate and make up half of the system. The other half is the air inlets. The air inlets determine the

air flow patterns within the house by their location and adjustment. Adjustment, of course, means management.

"If you have automatic inlet controls, you've eliminated the job. But most of our houses have adjustable inlets which must be managed," he says.

If you have adjustable inlets, Walpole prefers that they be controlled by winches located in the center of the house. He also recommends investing in a manometer. This is a device that measures the negative pressure that is built up when fans exhaust air from the house. The inlets should be adjusted to provide a negative pressure of .06 inches water while the fans are running.

If you don't have a manometer, there are some low-cost air velocity meters available. (Check with your serviceman.) You should have a velocity of 600 to 800 feet per minute through the inlets.

A good manager learns how to adjust the inlets depending on the number of fans running. He knows from weather forecasts how many fans will be running at night and how many will be running through the warm part of the day. He finds time to make the necessary adjustments at least twice a day.

What about the poor manager? The most common problem is inlets open too wide, giving decreased air velocity. The immediate result is lack of mixing of fresh air with pen air, uneven temperatures throughout the house, and the development of wet areas. To correct these symptoms the ventilation rate is frequently increased. This often helps, but at the expense of the fuel bill.

Another result of inlets being open too wide is loss of warm pen air by chimney action while the fans are not operating. When ventilating by time clock some of this loss is inevitable, but if the openings are twice as large as proper the heat loss will be twice as much as necessary.

What are some other signs of a good manager? He has made the house as air tight as possible so all the ventilation air must come through the inlets where it can be controlled. The building is well maintained; doors fit tightly, and the crack between the foundation and sill has been sealed.

The good manager has clean fans and shutters, and the fan belts have the proper tension. He knows if a shutter freezes shut (or open) or if it doesn't move freely because of a mechanical defect. And he corrects the problems as they occur.

Good management of the ventilation system provides an optimum environment for bird growth at a minimum cost. Poor management results in a less desirable environment and higher fuel bills. A final thought—if you have ambition to be a top grower for your company, it will only happen if you are a top manager.



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