



CHICKEN *talk*

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Will ammonia *really* hurt broiler performance?

Ammonia is a problem that plagues the poultry grower as well as the integrator. The most common statement that is made is "I have a little ammonia in my house, but it's not bad." The truth of the matter is that the average grower is unable to detect ammonia in the house until it is excessive. Most growers will not be able to detect ammonia levels below 50 parts per million (ppm).

The USDA-ARS Poultry Research Lab in Starkville, Mississippi, examines ammonia levels and their effects on broiler performance. Data in Table 1 from 20 years ago demonstrate that ammonia levels of 50 ppm are very detrimental to growth rate. Current research (Table 2) demonstrates that levels of as low as 25 ppm can be detrimental to the bird. It has been established that levels of 25 ppm will cause an increase in mucus secretion in the windpipe. What does this mean as far as the grower is concerned? First, a bird cannot cough – it does not have a diaphragm. Coughing allows most animals to expel any foreign material in their windpipes – dust, bacteria, mucus, etc. However, since birds cannot cough, they must rely on the small hair-like projections called "cilia" to remove foreign material from their windpipes.

However, when elevated ammonia levels (above 25 ppm) cause increased mucus (25 ppm) secretions in the windpipe, the cilia are not able to move foreign materials out of the windpipe. The mucus inhibits the normal movement of the cilia. When this happens, foreign organisms have the opportunity to colonize, grow, and cause the disease.

How do we get rid of ammonia?

How do we get the levels of ammonia low enough so that it does not cause a problem? Most people do not want to hear the answer: VENTILATE. Sure, ventilation costs money, but the alternative is not good. It costs you more money not to ventilate. Look at tables 1 and 2 and see how many pounds of meat elevated ammonia levels cost. My general story is that every one-dollar spent on additional fuel will return two dollars in grower payment. However, you can go overboard with ventilation and spend excessive dollars on fuel. Here is a simple method on how much you should ventilate. If litter builds up on your shoe bottoms when you walk through the house, then you are not ventilating enough. However, if you walk through the house and do not get a little buildup of litter on your shoes, then you are probably ventilating too much. It would be nice to have a formula that told you how much to ventilate; however, there is not one. A good estimator is the best that we have for the time being. Use it.

What about litter treatments for ammonia?

A very common problem is in the improper use of a litter amendment (ammonia control). If you use a litter amendment and reduce the ammonia, and at the same time you reduce the fan runtime, you are making a mistake. You think since you cannot detect ammonia, you can save money by reducing the fan runtime. However, ammonia is not the reason for running the fans in the first

place. The fans are used to remove moisture from the house. When you reduce the fan runtime, the moisture level in the house is increased, and the additional moisture causes an increase in the ammonia level. In this case, the litter amendment is now used up in one week as opposed to lasting three weeks. Do not reduce the fan runtime when

using a litter amendment. This will keep the moisture lower in the house and allow the litter amendment to last longer. If it lasts for three weeks, then the ventilation level will probably be enough that the ammonia levels will not be high enough to cause a problem.

Take Home Message

Ventilate the poultry house to get rid of moisture, and ammonia levels will not be excessively high. If at all possible, use 5-minute timers. This will create a cycle that will not allow the ammonia levels to get as high as they normally would with a 10-minute timer.

Table 1. Effect of ammonia on average body weight (lb) at 7 weeks of age in 1980.

Ammonia ¹ (ppm)	Male (lb)	Female (lb)	Average (lb)
0	4.44	3.72	4.08
25	4.25	3.59	3.92
50,50%*	4.32	3.60	3.96
50	4.06	3.47	3.77

¹ Birds subjected to ammonia for the first 4 weeks. No ammonia 5 - 7 weeks.
* Ammonia for 12 hours and no ammonia for 12 hours for the first 4 weeks.

Table 2. Effect of ammonia on average body weight (lb) of males at 7 weeks of age in 2002.

Ammonia ¹ (ppm)	4 weeks (lb)	7 weeks (lb)
0	2.99	6.74
25	5.95	6.55
50	2.41	6.24
75	2.47	6.23

¹ Birds subjected to ammonia for the first 4 weeks. No ammonia from 5 - 7 weeks.

For additional information, contact **Berry Lott** at 662-325-3416
or by e-mail at blott@poultry.msstate.edu.
Also see www.msstate.edu/dept/poultry/



msucares.com

By **Berry Lott, Ph.D.**, Extension Professor/Poultry Science, Mississippi State University

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