

Ammonia in the poultry house sabotages production; can impact poultry workers' health

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Too many producers accept high levels of ammonia in the poultry house as an inevitable nuisance — something to be tolerated. But, tolerating ammonia can negatively affect flock performance and can create health problems for those who work in the poultry house. And, in a growing number of cases, elevated levels of ammonia have resulted in community strife and litigation against producers.

Ammonia is the natural by-product of the chemical reaction between manure in the litter and moisture. The wetter the litter, the more ammonia in the air. Moisture in the poultry house can have any number of sources, ranging from the natural humidity in the air, to foggers and evaporative cooling pads, to the watering system. You can control some, but not all, of these sources.

You can manage ammonia levels by paying close attention to litter conditions. If the litter is too wet, it's time to do some detective work and find the source of the moisture. The best way to quickly determine litter condition is to grab a handful near a drinker and squeeze. If the litter clumps together in a ball, it is too wet. If the litter falls apart immediately, it is too dry, creating dusty conditions that can harm production. If the litter clumps briefly and then crumbles apart, it has the correct moisture content — about 20 to 25 percent.

If the litter is substantially wetter under the drinker line than elsewhere, the source of wet litter is undoubtedly the watering system. Wet conditions are inherent in open watering systems, such as bells or troughs. If you are using such a system, your best chance for reducing ammonia levels is to replace it with

an enclosed system with nipple-type drinkers. However, enclosed watering systems require proper management. This means ensuring the drinkers are at the correct height for the birds' age and size and making sure the water pressure is correct. Pressure too high causes wet litter; pressure too low stunts the birds' growth. Another source of wet litter is leaking lines and drinkers. You should correct all leaks and drips as soon as you find them.

There are some who counsel growers to manage their watering system by targeting specific flow rates. For years, the poultry industry focused on measuring flow rates to determine how well a drinker performed. But, research revealed that this emphasis on flow rates was counterproductive. Flow rates merely tell how much water passes through a drinker and not how much goes into the bird or how much is spilled onto the litter. Ziggity recommends judging a drinker's performance by the measures that truly matter — bird performance, not by a preconceived flow rate that has no real meaning.

Proponents of high flow rates will even offer complicated formulas to suggest how much water to supply the birds. However, this ignores how birds drink: by pecking the trigger pin. Chickens can only hold so much water in their beaks. If the drinker discharges more, that water ends up on the litter.

The consequences of wet litter and high ammonia levels cannot be over emphasized. People usually can detect ammonia at around 15 parts per million (ppm). However, prolonged exposure desensitizes the nose. Some growers who have worked in the poultry house environment for years cannot detect ammonia at 50 ppm, a level considered threatening. The U.S. Environmental Protection Agency says humans should not be exposed to 25 ppm for eight hours or longer and exposure to 35 ppm should not exceed 15 minutes.

The ammonia is at its strongest concentration at litter level, where the chickens are. The ammonia will dissolve in the fluid around the eyes, causing irritation. In

greater concentrations, the birds can go blind. Other drawbacks of ammonia and wet litter include increased foot lesions, breast blisters, skin burns and scabby areas. Any disease in the birds takes feed energy away from meat production to fight off the condition. Additionally, any injury or unhealthy condition increases downgrades and condemnations. And, recent university studies have demonstrated ammonia concentrations above 25 ppm have a definite impact on a grower's settlement check.

Ammonia and wet litter also foster disease in the flock. Even at a level of 5 ppm (undetectable to the human nose), ammonia can irritate the protective lining of a chick's respiratory system, making it more susceptible to disease. And, the wet litter conditions encourage pathogens to grow. Among the more serious diseases fostered by wet litter are avian influenza, gangrenous dermatitis, exotic Newcastle disease, gumboro, botulism, E. coli and salmonella. Wet litter also encourages coccidiosis.

Heavy concentrations of ammonia can cause a poultry operation to smell bad. And, the wet litter provides a very fertile breeding ground for flies. Both conditions can annoy neighbors and as rural areas become more populated, people offended by the smell and flies are more likely to turn to the courts for help. As a practical matter, you cannot eliminate ammonia but should strive to keep it below 25 ppm.

Besides managing the watering system, there are several other steps you can take to reduce ammonia levels:

- Maintain adequate ventilation in the house, even in winter. During cold weather, many growers will reduce ventilation to save on heating costs. The loss of income because of the ammonia can rapidly outpace any savings on heat.
- Immediately remove any wet spots that develop and replace with dry litter.
- Ensure there is adequate drainage around the house to prevent surface water

from getting in.

- Remove all caked litter after each flock and ventilate the house well to dry the litter.

Wet litter and ammonia pose very real threats to your poultry flocks and to your settlement checks. These unsanitary conditions also threaten your health and the health of anyone else who must work in the poultry house. But, there are a number of steps you can take to reduce wet litter and ammonia, especially correctly managing your watering system and ventilating your houses.

Ziggity Systems, Inc. is the only manufacturer 100 percent focused on poultry watering for improved performance. For more information, write Ziggity Systems, Inc. at 101 Industrial Parkway, P.O. Box 1169, Middlebury, Indiana 46540-1169 USA, call +1 574.825.5849, fax +1 574.825.7674, or visit its Web site at www.ziggity.com.