

Poultry Engineering, Economics & Management

Newsletter of the National Poultry Technology Center, Auburn University

***Critical Information for Improved Bird Performance Through Better House
and Ventilation System Design, Operation and Management***

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Is Poor Drinker Management Costing You Fuel Dollars?

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It is well understood that in winter, the main purpose of ventilation is not temperature management but air quality control: we monitor relative humidity and adjust ventilation accordingly to reduce overall litter moisture. This also keeps litter moisture down. If we do not control litter moisture, ammonia levels can rise and cause multiple problems such as poor bird health, impaired paw quality and overall lowered flock performance.

One factor we too often see in the field that makes the ventilation job more difficult – and expensive – is poor drinker line management. We provide water for birds to drink, and if our drinkers for any reason are allowing water to be wasted, going into the litter instead of the birds, we're losing money, both at catch time because of lower flock performance, and through increased operating costs. Wasted water can only be taken out of the house by increasing ventilation or later by the litter machine. Both methods will result in an increase in flock cost.

The amount of moisture having to be removed from even a well-managed poultry farm can be staggering to consider. Birds need a lot of water to grow properly and efficiently, but typically only about a third of the thousands of gallons we pump through the drinker lines actually comes out of the house in bird live weight. The rest of that moisture either stays in the litter or is pumped out of the house by ventilation. We certainly don't want to do anything that makes it harder for birds to get water or makes less water available. We do want to keep litter drier and reduce the amount of work the ventilation system has to do. And that's what this newsletter is about – cost-effective, simple ways to minimize excess moisture from poor drinker management. If you can reduce the amount of moisture put in the house, you can then reduce ventilation by some correlating amount without harming overall air quality. If you can cut back on ventilation without sacrificing air quality and save fuel cost all at the same time – that is a win-win-win situation.

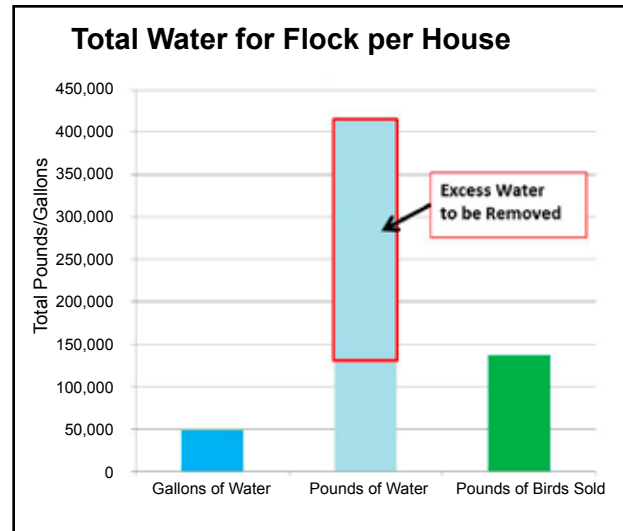
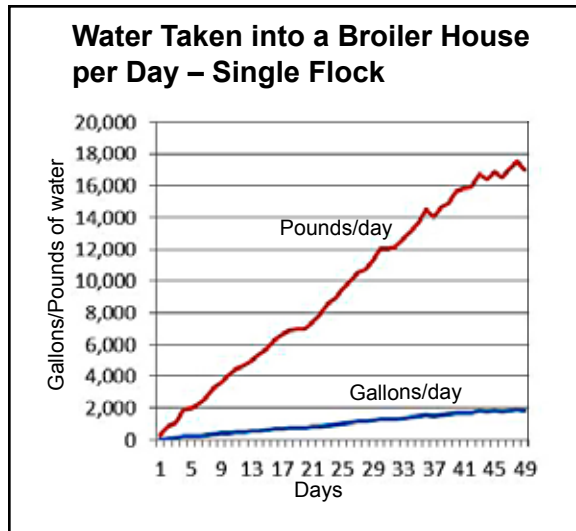
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This drinker system has an issue with leaking nipples. Notice wet caked litter under the drinker lines as well as drops of water that are continually leaking from the nipples. This system may benefit from a good cleaning and consistent flushing program or could be in need of nipple replacement. This problem has been allowed to progress far too long and now the grower has a wet litter problem that he will not be able to ventilate himself out of.

An example of just how much water comes into a modern poultry house is illustrated in the charts below. These numbers come from real world poultry operations in the Southeast raising a 6.25-pound broiler in 49 days.

The total amount of water having gone into the house at 49 days was 48,165 gallons or 414,934 pounds. That equals 207 tons of water. At catch, this house only produced 137,200 pounds (68 tons) of birds out the front door. So in this case, only 33% of the total water going into the house came out in the form of saleable bird weight. Where did the other 67%, or 139 tons, go? It was either deposited into the litter or removed through the fans.



As you can see, there is a lot of water to be removed that the birds do not convert into saleable pounds. It is generally accepted that around 65-75% of the water coming into the house has to be removed by means other than the catch crew. There are only two options – ventilation or the litter machine, and ventilation is the preferred method. In the example above, if poor drinker management caused only a 2% increase in total incoming water, it could amount to approximately 1,000 gallons more water to be removed over the course of the flock. This would result in equivalently more ventilation needed for moisture removal. At an average outside temperature of 40° F and LP at \$1.75/gal, and assuming the 2% more water caused us to increase ventilation rates by an equal 2%, that would result in about \$110 more fuel cost per house per flock. That does not sound like much, but when we consider that all we have to do to avoid this cost increase is a little management of our drinker systems, it becomes an “easy” savings to obtain, not to mention the other benefits that better drinker management will yield as we discussed earlier – improved paw quality and better ammonia control, which equals overall better performance.

Further, you have to realize that poor drinker line management and maintenance can result in much more than 2% waste, and every 2% more water wasted, going into the litter instead of the birds, is likely costing the grower another hundred dollars or more.

What aspects of drinker management do growers and managers need to pay close attention to in order to avoid wasting water? The three most common problems are:

1. Drinker Nipple Leakage
2. Improper Drinker Line Height Adjustment
3. Improper Drinker Line Pressure Adjustment

Drinker Nipple Management

This is probably the most common issue we see in the field. Most modern drinker systems have an acceptable nipple that, when new or when cleaned and maintained properly, minimizes leakage. However, it doesn't take long for the rigors of a modern poultry house to impact the drinker system. Bio-films and contaminants getting built up in the drinker lines and ultimately the nipples themselves will eventually decrease the nipple's ability to deliver the appropriate amount of water and to completely stop flow when not being activated by a bird. The best way to combat this problem is consistent drinker system flushing and cleaning. Drinker systems need to be flushed and cleaned with an accepted cleaner between every flock. Consult your specific drinker system literature or contact the company's representative for accepted cleaners for your specific system. There are a few cleaners that most every system will accept. One of the more common cleaner/disinfectants proven to be effective is 35% hydrogen peroxide, which can be found at most poultry supply locations in gallon jugs. A grower can use a medicator system and pump the 35% peroxide through the medicator at a rate of one ounce per gallon of water into the drinker system. Flush with this mixture until foamy water comes out the end of the drinker lines, then let it sit for

at least a couple of hours. It is a good idea to manually activate every nipple on the line while the cleaning agent is in the system. This will help keep the nipples themselves clean.

Next, flush the lines with clean water until nothing but clear water comes out the end of the drinker line flush port. It is also a good idea to flush the drinker lines with clear water at least twice during the growout for at least 20 minutes per line. This helps keep the bio-films and contaminants to a minimum and helps make the 'between flock' cleaning more effective. It must be noted that if a drinker system is already heavily contaminated with bio-film and nipples are leaking badly, this simple hydrogen peroxide flush will likely not be sufficient to get the system back to optimum working order. If this is the case, it is suggested that the grower contact a representative for their specific drinker system for directions on how to clean an extremely dirty system.

Care must also be taken when running other additives through the drinker system, such as vitamins or iodine. Some of these additives can cause buildup in the drinker lines and contribute to leakage problems. Some can encourage the formation of bio-films in the drinker line, especially sugary substances. These bio-films cause pressure problems and leaky nipples and can pose health problems for the birds. Flushing the drinker lines with clean water after any additive is run in the system will help avoid these problems.

Drinker system nipples can also leak from wear after an extended life in the house. Most drinker system nipples should last 5-10 years before replacement or refitting is needed. Most modern systems now have removable nipples that can be replaced individually without having to replace the entire line or system. Some drinker systems have rebuildable nipples. Either way, if your system is in this 5-10 year age range or beyond and your nipples tend to leak, it is time to consider replacing them with new or rebuilt nipples. Cleaning will not solve an age and wear problem.

Not necessarily in the category of nipple management, but definitely having the potential to impact nipple performance is proper drinker system filter management. Filters must be changed on a regular basis, preferably after every flock. It may become necessary to change a filter during a flock if a grower's water supply tends to be fouled with contaminants. If filters are left unattended and become full of contaminants, they can not only restrict water flow, but may allow some contaminants to start passing through, clogging up drinker regulators and causing nipples to get hung open and leak water onto the litter.

Drinker Line Height

Different systems' nipples may be triggered differently and this will change the height the lines need to be in relation to the bird at varying ages. Growers should check with their integrator's service representative and make sure they know how the the drinker system's nipples operate and how to match that to the bird's age. Having the drinker lines too high or too low will impact how much water the birds get as well as how much water the birds waste. The most common problem is growers not making the appropriate adjustments in a timely manner. The speed at which the modern broiler grows is remarkably fast and the height relationship to the drinker system changes daily. Fluctuations in litter can affect the bird/drinker height relationship daily, as well.

If birds can drink while sitting down, that is a sure sign that your drinker lines are too low. A high percentage of the water this bird is activating is getting into the litter.



If allowed to go on too long, leaking nipples can cause a significant wet litter problem in a poultry house. These nipples have gone too long without proper attention and should be cleaned, rebuilt or replaced. Once leaking reaches this extent, ventilation is no longer effective.



Birds should be able to stand comfortably and easily activate the nipple to maximize the amount of water getting into the birds and minimize the water being wasted.



Therefore, the drinker system height needs to be adjusted daily. If a grower goes a week without making drinker height adjustments, he can be as much as several inches below the birds' optimal drinker height. This can not only result in water wastage, but will impact bird performance. Having the drinkers too high can be equally detrimental. Having to reach too high for water will cause birds to waste more water as they can only peck at the nipple instead of activating it properly. Also, making large height adjustments, 2-3 inches at a time, will cause the birds stress as they get accustomed to the drastically changed height. This may cause some birds not to drink, negatively affecting performance. It is always better to adjust drinkers daily in small increments. A grower should also monitor the results of each drinker adjustment to see how the birds relate to the new nipple height and make further adjustments if needed. Growers should also monitor the levelness of the drinker lines daily and make adjustments as needed. Any major dips or humps in the line can cause leaks or a lack of water in those areas.

Drinker Line Pressure

Line pressure, much like height, needs to be adjusted often throughout the flock. Daily adjustments may not be necessary, but are encouraged. Adjusting pressure once a week is usually sufficient for most of the flock. However, as the birds approach market age, more frequent attention should be paid to line pressures. In general, line pressures should always be increasing as the birds age.

Too much pressure typically contributes to water waste and leaky nipples. Too much pressure causes the birds to waste water when they trigger a nipple as well as making it harder for the nipple to properly shut off the flow. Too little pressure will effectively starve birds for water the further away from the regulator you go. Careful monitoring of the sight tube balls at each end of the line is needed to assure that pressure is equal the entire length of the drinker system. If the sight balls are not at the same height within the tubes, this could indicate a pressure issue or a levelness issue. Clogged drinker lines could also contribute to this problem. Hence, proper flushing and cleaning procedures also help a grower effectively manage their drinker pressure.

The Bottom Line

Proper drinker management takes very little additional time, yet offers quite a few benefits. In addition to the \$110 increased fuel cost shown in our conservative example, operating additional fan run-time and removing additional cake has costs, as well. Performance losses from poor drinker management can also be very expensive. Proper environment will always be a key factor in successful broiler production, and drinker management plays a key role in ensuring optimal bird growth in a proper environment. Don't let poor drinker management force you to increase your ventilation rates, add de-caking time, and add more overall cost to your flocks this winter.

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