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## PB1533-Nipple Watering Systems for Broilers

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# Management of Nipple Watering Systems for Broilers

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Nipple watering systems for broilers have become very popular in recent years. This is mainly because these systems save labor by eliminating the chore of cleaning waterers. Although labor is greatly reduced with nipple watering systems, this does not mean that they require less management. In fact, nipple waterers demand more time, knowledge and effort to operate properly than do open systems. Problems caused by insufficient or improper management of nipple watering systems can have a serious impact on broiler performance.

## Water Consumption

**W**ater is the most important nutrient consumed by an animal. A bird can survive several weeks without food, but only a few days without water. The purpose of any broiler watering system is to provide sufficient water for optimum bird growth and efficiency.

Broilers drink a great deal of water. During its life-time, a 5-pound broiler will consume about 18 pounds (2.2 gallons) of water, compared to just 10 pounds of feed. Recent studies show that daily water consumption of a broiler can be approximated by multiplying the age of the bird in days by .18 ounces of water. For example, a 10-day-old bird will drink about 1.8 ounces of water during a 24-hour period.

It is important to know the volume of water a broiler will consume on a given day. Drinking water is often used to provide medications, vaccines, vitamins and electrolytes to broilers. To ensure that each bird receives the proper dose of such substances, it is essential to be able to predict consumption. In addition, monitoring daily water consumption of a broiler flock and comparing it to that of past flocks can alert a producer to potential disease and management problems, so the producer can start treatment or corrective action before the problem becomes more severe. Table 1 shows the daily water requirements for broilers at various temperatures.

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## Advantages and Disadvantages

The primary advantage of nipple drinkers is reduced labor. Some open watering systems, such as bell shaped waterers, v-troughs and cups need to be cleaned and disinfected daily. This dreaded chore is a back-breaker and requires significant time. Nipple drinkers require only minimal cleaning between flocks. There is some published evidence that broilers raised on nipple drinkers perform slightly better than broilers grown out on open systems. A few research studies and field trials have indicated that feed conversion may be improved in flocks on nipple waterers; however, the weight-to-age ratio may be marginally decreased. Almost every study comparing drinker types has documented that broilers are healthier when drinking from nipple drinkers. Mortality, condemnations and medication costs are almost always lower with nipple systems: bacterial contamination of the birds' drinking water is greatly decreased and litter conditions are usually much improved.

The perfect drinker has yet to be invented. Nipple drinkers have disadvantages, too. The initial cost of nipple systems is greater (30 percent or more) than conventional open systems. Repair and maintenance of broken or worn parts are also more expensive. Nipple mechanisms should not be expected to last forever. De-

Age Weeks	Average Temperature Inside Broiler House		
	75°	85°	95°
	gallons per 1000 birds		
1	6	7	8
2	17	22	35
3	28	40	70
4	39	58	97
5	49	72	117
6	56	85	132
7	66	94	144
8	70	98	150

pending on type and manufacturer, they will eventually require replacement.

Management of nipple drinkers is much more difficult than that required for most open systems, and mistakes made managing nipple systems are much more serious. Poor management almost always results in costly production losses.

Some broiler producers believe that certain types of nipple drinkers restrict growth of broilers and that this restriction increases as broiler weight increases. There has also been some concern that during extremely hot weather, birds on nipple drinkers do not perform

or survive as well as birds grown on open waterers. Although there is little research data to support or refute these concerns, special care does need to be taken to ensure that nipple waterers are in top working order during warm weather and with large broilers.

### Management

Most nipple systems rely on pressure regulators to control the amount of water birds receive when the nipple mechanisms are activated. With such systems, water pressure must be adjusted weekly to levels recommended by the manufacturer. Keep water pressure low when chicks are

young so that water will flow easily from the nipple when it gets activated by the lightest touch. As birds get larger and stronger, gradually increase pressure so that more water is released when the nipple is activated. Improper pressure may prevent birds from getting adequate water or may cause wet litter under the drinkers.

Nipple height should be adjusted as often as needed. As a general rule, this means that height adjustments must be made at least every other day for the first two weeks of the flock and daily from that time on. The bottom of the triggering pin should be at the eye level of day-old chicks. Nipples should be raised gradually so that birds must reach up and stretch slightly to activate the nipples from five days onward. Figure 1 shows the approximate heights

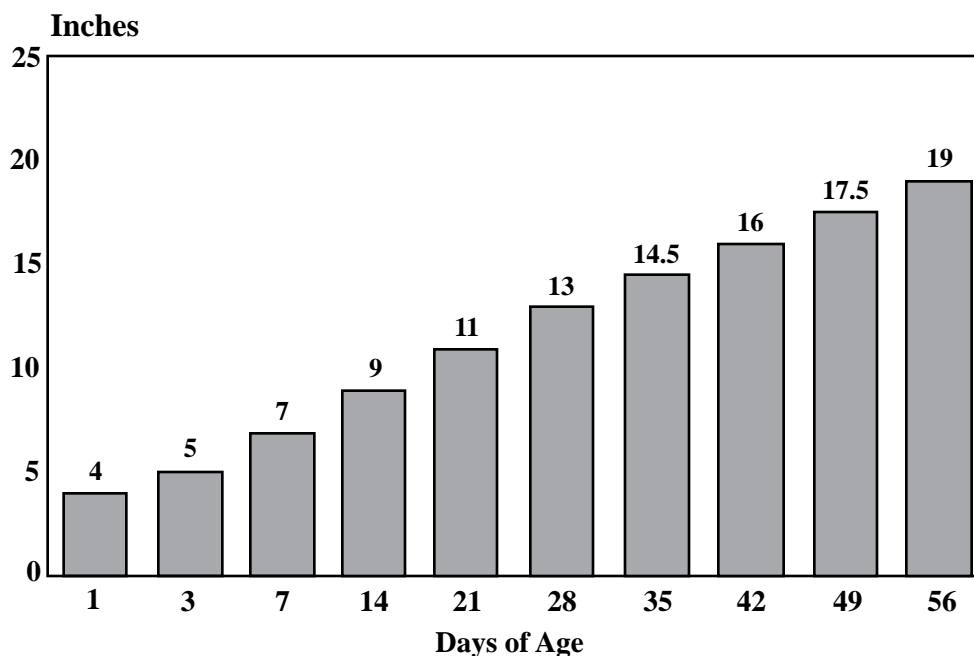
that the nipples should be above the floor through a typical growout. The breed of broiler that your company uses may require some adjustment of these general values.

The importance of constant and careful management of nipples cannot be overemphasized. There have been numerous cases in which growers have obtained excellent performances from nipple drinkers for several growouts and then suddenly have experienced high mortality, wet litter and poor bird performance. In many cases this has happened because the grower began to pay less attention to the management of the nipple system than when it was first installed. Labor may be decreased with nipple drinkers, but the need for good management is greatly increased.

## Common Problems and Corrective Actions

Many serious problems associated with nipple drinkers are caused by improper installation. Floors of broiler houses with nipple drinkers must be smooth and level. Uneven floors make consistent height adjustment and pressure regulation impossible. Floors should be shot with a transit to ensure they are level. A gradual grade from one end to the other is acceptable as long as it is slight (no more than 4 inches of drop). If more than 4 inches of drop is present, it is necessary to break lines into shorter segments and to install additional regulators to keep pressure within a line consistent. Regulators must be installed on the high ends of the lines to minimize problems with

Figure 1. Approximate height of nipples above floor at various ages.



air locks. Special care should be taken when cleaning out houses and spreading litter to make sure the floor under the water lines remains even.

Air locks can be a serious problem, especially when chicks first arrive and water pressures have to be set low. Air locks occur in high spots along the drinker line. Adjust the winch drops as needed to maintain the line perfectly straight. To further minimize air locks, raise the regulator end of the drinker line slightly so that any air in the system will be able to escape through the riser tube. It's a good idea just to pick up the regulator end of the line and lift it a foot or two for a few seconds whenever you are in the house. This floods the line with water and lets air out. When raising the regulator end, do not grab the regulator itself; you could break the plastic line. Instead, use the metal support pipe or bar to lift the line.

Filtering of water before it enters the nipple systems is critical. Filters should be checked at least weekly and replaced when necessary. Special problems such as iron precipitation, mineral deposition and bacterial contamination may require sand media filters with back flush capability, water softeners and disinfecting systems.

Caked litter can accumulate under nipple drinker lines. Often the problem is caused by leaky nipples, improper pressure or improper

height adjustments. If litter underneath a particular drinker line or segment is prone to caking, winch the entire line up about 4 feet and shut off the water supply to that line. Mark the water level in the riser tubes at each end of the drinker line and wait 30 minutes. If there is no change in the water level in the riser tubes by that time, the problem probably involves improper pressure or height adjustments. Try decreasing the pressure slightly and raising the line an inch or two higher than other lines in the house. If the water level in the riser tubes has dropped after 30 minutes, the problem is likely due to nipples leaking. Look for dripping and replace or repair them as necessary.

Occasionally growers have had problems with nipples dripping large amounts of water. Constant dripping is unacceptable. Most manufacturers warranty their systems and replace dripping nipples free or at reduced cost. If you ever have a serious dripping problem, contact the company that made your system and your broiler company.

## **Maintenance**

Nipple drinkers do not require the frequent cleaning and scrubbing that open systems do; however, nipple systems need regular preventive maintenance to ensure that they continue working at their best. High-pressure flushing is one drinker-maintenance chore that is so important that it needs to

be performed after every flock. In nipple systems, bacteria, mineral deposits, dirt, debris, etc. can build up in the lines. High-pressure flushing is the simplest, easiest, most effective method of cleaning the lines. High pressure, in this case, means 15 to 30 pounds per square inch (psi). Do not use more than 30 psi, as higher pressures can damage the system. It doesn't take much water to flush—five to 10 gallons is plenty. All enclosed systems have instructions on how to flush the lines. It is simple to do, takes very little time and is absolutely essential after every flock.

Other routine maintenance procedures need to be performed periodically as well. The outsides of the drinkers should be cleaned whenever the house is cleaned. Use plain water or a mild soap solution. Never use solvents, oil-based or corrosive materials on the drinkers. Make sure the filtering system is adequate and that all dirt, sand, precipitated minerals, etc. are being caught before getting into the drinking systems. Check filters weekly and replace them as soon as they collect significant amounts of debris. In most systems, proper pressure is critical during various stages of growout, and it is important that the water columns in the riser tubes be clearly visible. Keep the riser tubes clean.

Nipple drinking systems must be thoroughly inspected in the spring **before** hot weather

arrives. It is essential that birds be able to get all the water they need during hot weather. Check water supply lines and drinker lines to make sure there are no restrictions or blockage. Have your watering system in peak condition **before** heat becomes a problem.

During cold weather, drain the lines between flocks or keep enough brooders/heaters burning to keep temperatures above freezing. Never work on plastic water lines when they are frozen—they shatter easily. If for some reason lines do become frozen, just turn on the heat in the house or wait until the temperature rises and let them thaw. Do not use torches to thaw lines.

As time goes on, cables supporting drinkers sometimes stretch and floors often settle or are dug up during cleanout. Smooth out floors and adjust cables as necessary to keep the drinker lines and the floor level.

As mentioned previously, whenever you are in the broiler house, it is a good idea to lift up the regulator end of the line for a few seconds. This helps flush out and clean the regulator and gets rid of air in the line. Once or twice a year, regulators require more thorough cleaning. Contact your particular drinker manufacturer's representative for instructions on how to accomplish this.

Often growers ask whether they should put anything into a drinker system to clean it. Barring some unusual

problem, no cleaner or disinfectant needs to be run through a nipple system. High pressure flushing, if performed regularly, will keep lines clean in most situations. Some chemicals can be harmful to certain drinkers. There have been instances where substances put into nipple systems have chemically reacted with electrolyte/vitamin supplements, medications or vaccinations and gummed up drinkers. Substances containing sugar carriers are particularly prone to causing problems with gumming; carbonate carriers are preferred. Never run anything through your drinkers for 72 hours before medicating or vaccinating your birds.

The drinker system should not be disinfected while birds are still in the house. If for some reason you have a chronic bacteria problem in your water source and continuous disinfection is necessary, use extreme caution. It's a good idea to get professional help in setting up a continuous disinfection or filtering system.

If it becomes absolutely necessary to use a chemical cleaner or disinfectant in the lines, check with your drinker manufacturer and flock supervisor to make sure the chemicals you use will not harm your drinkers or future flocks. Take care to ensure that the chemicals get through the entire system. It's a good idea to put food coloring in with the chemical—that way, you will be able to "see" that the chemical gets to where you want it. Trigger all

nipples so they are cleaned or disinfected as well. Flush thoroughly after an appropriate stand time. Medicators need to be thoroughly cleaned on a routine basis and chemicals may be required; however, it is not necessary to run these chemicals through the entire drinker system. Attach a hose to the output side of the medicator and run the cleaning solution into a bucket or outside.

### Summary

Nipple drinkers minimize labor, but they are not maintenance-free. With just a little effort and a planned routine-maintenance program, your enclosed drinkers will operate better and longer. More importantly, you will be eliminating or at least minimizing problems before they cost you money.

This information was originally published in "*Management of Enclosed Watering Systems for Broilers*" by Michael Lacy and Larry Vest, Georgia Cooperative Extension Service. It has been adapted for use in Tennessee by H. Charles Goan, Professor and Leader, Animal Science - Poultry.

# *a U.T. Ag. Extension Reminder...*

## **Maintain High Water Quality Standards on Your Farm**

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What is "safe" drinking water for humans, poultry and livestock? Safe drinking water could be thought of as water that is free of harmful bacteria, viruses, parasites and chemicals. Since many disease-producing organisms are too small to be seen with the naked eye, thousands of them may be in a single drop of water. This contaminated water can affect the health of farm families and the health and performance of their poultry flocks.

Since many factors may affect the quality of well water, it is essential that testing be done on a regular basis.

A good rule of thumb is to test once a year for the presence or absence of total coliform bacteria, nitrate-nitrogen, pH and total dissolved solids. Additional information on water testing can be obtained from your county Agricultural Extension Service office or from your Environmental Specialist located at the county health department.

You should test your well water if:

- there are unexplained family illnesses
- there are unexplained changes in poultry or livestock performance
- you notice a change in water taste, odor, color or clarity
- you have a spill of chemical or petroleum products near your well
- you stack broiler litter near your well
- you apply chemicals or manure within 100 feet of your well.

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