Good water quality is the ba

Chickens and other birds are bred for high performance - converting feed as efficiently as possible into animal protein. In order to achieve this goal, all circumstances should be optimal, such as the availability of ample and good drinking water. Keeping track of water quality and making sure the drinking system is working properly is of great importance.

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Checking the water on the poultry farm is something that should be done on a regular basis to ensure that the adequate quantity and quality of water is available. Water, along with temperature management, good air quality, clean formulated feed and protection from disease, are the five basic needs of poultry to optimise bird performance. Water and feed consumption are directly correlated, meaning that if one decreases, they both decrease. So if water consumption drops for a few days, then feed consumption will decrease as well. While water is an important nutrient, it is also a critical component of the environmental control system when using evaporative cooling to keep the birds cool in hot weather.

In this article we will look at factors in the water system that should be evaluated to ensure that plenty of water is available when the birds need it. When checking the water system, the complete system should be evaluated. This means starting at the well and working through to the end of the drinker line.

Starting at the well

At the well, a proper well head should be in place to ensure that rain water and/or runoff does not contaminate the water at its source. It is wise to conduct a water quality test regularly (about once a year) to determine the mineral content, pH and hardness. Low or high pH, high mineral content, or a combination of elevated minerals can impair equipment function and efficacy of vaccines or other medications administered through the drinking water. For example, iron in the water from wells with high iron concentrations can be oxidised. The resulting material is a brownish-reddish particulate that can plug water filters and result in leaky drinkers. It is not uncommon in the US to speak to producers that have to change water filters every 2-3 days during periods of high water usage. Unfortunately, oxidised iron is not the only thing that can plug water filters. Oxidised manganese, magnesium or sediment can cause regular changes of water filters. If a water test indicates a mineral problem, a water treatment professional should be consulted to determine what steps are required to improve the water quality.

Depending on state regulations in the US, most states require that new wells be tested for microbial contamination. Normally this looks specifically for the presence of coliforms that can indicate faecal or runoff contamination.

Water devoid of any microorganisms is desired, because even non-pathogenic organisms such as iron bacteria can cause the formation of a biofilm, which can restrict water flow and even block nipples on drinker lines. If bacteria are present, consult with a professional to determine the best protocol for shock chlorinating of the well. While this procedure can reduce microbial counts from wells, it may have to be repeated to keep the microbial counts low.

Ample quantity

Water volume and availability are important. When water use on a poultry farm is examined, the water used by the evaporative cooling system during hot weather can be as much as three times greater than water consumed by the birds. Therefore, when digging wells and determining how much water is needed by the farm, the equation should include evaporative cooling pads, fogging nozzles, bird water consumption and the number of poultry houses. Pipe sizing should be adequate to supply both the evaporative cooling needs as well as the drinking water.

The water pressure must be high enough at the well to ensure 60 psi at the house (1 psi = 0.069 bar). In most cases, this means that water pressure at the well will be 10-20 psi higher depending on the location of the well and its orientation to the house. While

sis for good bird performance

Water from two wells on the same farm can have very different quality.

Open buckets for stock solution can lead to water contamination.

60 psi at the house is desirable, note that the pressure going to the drinker lines may be different and the drinker manufacturers' guidelines should be followed to prevent water line regulator damage.

House water panel

Management of the system at the house water panel involves monitoring water pressure at several locations. Some house environmental controllers and alarm systems can be wired with gauges/ sensors to detect drops in water pressure. Water pressure coming from the well needs to be checked. Water pressure decreases after flowing through the water filter, pressure regulator and medicator, and as a result should be monitored prior to entering the house. Water pressure for individual drinker systems may vary, but in general it is somewhere around 20-30 psi. Closely monitor water pressure reduction at the filters and rinse or replace filters as they become clogged with foreign material.

Medicator pumps

Totally enclosed water systems have been adopted by the poultry industry. One of the biggest benefits from this type of system is the cleanliness and ability to prevent bacteria and other foreign materials from entering the drinking water. Birds obtain the water directly from the water system on demand by pushing a pin located on the bottom of the drinker line. Medicator pumps are a normal component of most poultry house water systems and are used to deliver vaccines, medications, water treatment and sanitation products. However, this is a weak point in the system. Open five gallon buckets (1 gallon = 3.78 litres) are the common containers used to mix stock solutions to be delivered through the drinker system and are a potential contamination source of the drinker line. It is recommended to use a covered container to prevent foreign material from being introduced into the water line.

Drinker lines

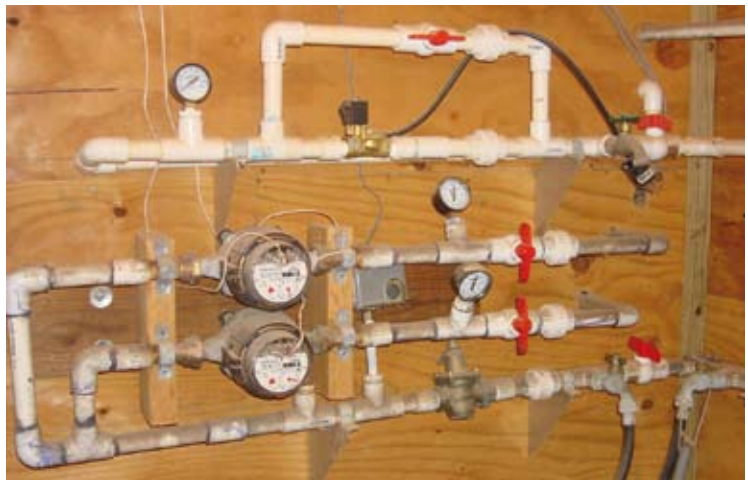
The regulator, water pipe, nipple and standpipe are all components of the water line that should be examined and maintained. For the most part these components are internal with the exception of the standpipe, which is usually a clear tube containing a floating ball to monitor water pressure with an opening at the top to allow air in the lines to escape. This opening is a potential spot for foreign debris, like dust, to enter the system. It is not unusual to observe standpipes in broiler houses that are so dirty that the ball can not be seen. Efforts should be made to regularly clean and sanitise the drinker line. One of the simplest things to do in the process is routine flushing of the water lines to be done following the use of the medicator to prevent bacteria or other organisms and material from accumulating. In between flocks, water lines should be sanitised and flushed with products that are approved by the drinker manufacturer and integrator to prevent damage to the water system or negative effects on the birds. A general rule for how long to flush water lines is about one minute for every 100 ft (30 m) of water line. Therefore, in a 500 ft (150 m) broiler house with water lines length around 250 ft (75 m), then the line should be flushed for about 2-3 minutes. Leaky drinker lines can occur due to improper use of water line sanitisers or from the introduction of foreign materials into the water (i.e. oxidised iron precipitant). However, regular maintenance of the water lines can prevent this and ensure that maximum equipment performance is obtained. Care should be taken when choosing and using water line cleaners. Consult with the drinker manufacturer before introducing a solution that could possibly damage the drinker system, and be sure to follow product guidelines on the concentrations to be used.

Drinker line height and pressure should be started low at the beginning of the flock and increased as the birds get older. Water pressure that is set too high during the beginning of the flock may restrict chick water consumption due to the inability to lead to push the pen properly. High water pressure can also result in more water wastage and wet litter. Drinker lines that are too high can restrict water consumption while water lines that are too low can result in wet litter that will have secondary effects. This could include a reduction in air quality (high ammonia), increased incidence of disease and increased carcass downgrades due to poor paws or breast blisters and burns.

Water meters

Most houses have water meters on the drinker line. Some farms have the water meters wired into the environmental controller, which can monitor daily water consumption and keep a history from a flock. The use of multiple water meters can provide additional information that can be utilised by producers in the daily management of the house and

Lidded buckets for stock solution are advisable.



Multiple water meters in a house allows monitoring at different locations.

farm. While having the water meter hooked to the controller is easy and provides accurate water consumption data, it is not a necessity as daily recording of the water meter reading can provide similar information. It is wise to monitor water consumption daily, because sudden increases or decreases can indicate issues with either the birds (environmental stress, disease) or the water system (leaks, air locks, water restriction due to residue build-ups).

Regular maintenance and good drinker line management during and in between flocks can improve both drinker and bird performance while extending equipment life. Care must be taken when running products through the drinker line to ensure that none of the internal parts are damaged and that no microorganisms are able to thrive. Before applying any water treatment a water test should be conducted. Application of treatments to control microbial growth, such as chlorine, can cause precipitants to form in water that has high iron or manganese concentrations. This will clog filters and possibly result in leaky drinkers, neither of which will be good for bird performance. Test wells routinely to ensure that water quality will not affect drinker function. By taking some time to do these steps, broiler and drinker line performance should be optimised. ■

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