

Water Line Sanitation

Providing a clean water source every day is essential to ensuring your flock's health and best bottom-line performance. The water lines that carry the water to your birds are not transparent; we cannot see what is happening inside them. It is easy to forget about this part of the building when cleaning and disinfecting between flocks. It is important to make a note to clean the water system after every flock.

Successful water sanitation begins with a thorough water line cleaning program. The variability and dynamics of water systems can create cleaning challenges, but these can be overcome with water quality information, a little effort and the right tools. Follow these guidelines, and your birds will have a first-class water supply:

Step One: Have Water Analyzed

Have water analyzed for scale-causing minerals: calcium, magnesium and manganese. If the water contains more than 90 ppm combined calcium and magnesium or 0.05 ppm manganese, you will need to include a "descaler" or an acid in your cleaning program. These products will dissolve the mineral deposits in water lines and fittings.

Step Two: Choose a Sanitizing Cleaner

Choose a sanitizing cleaner that can effectively dissolve any bio-film or slime in the system. Some of the best products for this job are concentrated hydrogen peroxides.

Prior to using any strong cleaners, make sure standpipes are working properly so air pressure buildup in the lines will be released. Consult equipment suppliers before using products to prevent unnecessary damage.

Step Three: Prepare the Sanitizing Solution

For best results, use sanitizing products at the strongest concentration recommended on the label. Most proportioners will only allow concentrations between 0.8 and 1.6% of the original material. If you need to use higher concentrations it is better to mix the stock solution in a large tank, and then distribute without use of a proportioner. For example, if a 3% solution is required, mix three volumes of the cleaner with 97 volumes of water for the final solution.

An excellent sanitizing solution can be made up by using 35% hydrogen peroxide solution. Mix this as described for a 3% solution.

Step Four: Clean the Lines

It takes 8-10 gallons of water to fill and clean 100 feet of ¾ inch water line. If your building is 500 feet long and has two water lines you should make up a minimum of 100 gallons of sanitizing solution. Water lines should be designed so that they can be opened to drain completely when the cleaning is complete.

Follow these steps to clean the water lines:

1. Open water lines so they drain completely.
2. Begin pumping the cleaner/sanitizer through the water lines.
3. Watch the water as it leaves the drain line for signs of the product such as foaming or suds.
4. Once water lines are filled with the cleaner, close the tap and leave product in the lines for as long as the manufacturer recommends (over 24 hours if possible).

5. Flush cleaner from the water lines after the holding period. Water used to flush the lines should contain the level of sanitizer normally used in the drinking water for the birds.

In the absence of a standard water sanitation program add 4 ounces of 5% bleach per gallon of stock solution and proportion at a rate of 1 ounce per gallon of water. This will provide 3–5 ppm of chlorine in the rinse water.

6. After cleaning, sanitizing and flushing the system, the water supply should be fresh and chlorinated (3-5 ppm in the drinker furthest from the source). If using an Oxidation Reduction Potential (ORP) meter, the reading should be a minimum of 650.
7. Water lines from the water well to the turkey buildings should also be cleaned and sanitized between flocks. It is best not to flush these outside water lines through the water lines inside the buildings. Connect a water hose to the medicator faucet to drain the outside lines.

Step Five: Remove Mineral Build-up

After lines are cleaned, descaler or acid products can be used to remove the mineral build-up. Use product according to the manufacturer's recommendation. Citric acid is one option:

1. Make a stock solution by mixing 4 – 6 packs of citric acid in one gallon of water. Proportion at one ounce per gallon (0.8% or 1:128). Fill water lines and let stand for 24 hours. It is critical that the water pH is below 5 for optimum scale removal.
2. Empty the water lines. Refill the lines with clean water containing 8-12 ounces of 5% bleach per gallon of stock solution proportioned at one ounce per gallon (0.8% or 1:128). Leave in the water lines for four hours. This concentration of chlorine will kill any residual bacteria, and further remove bio-film residue.

3. Perform a final flush of the water lines using water with a normal drinking water level of sanitizer (4 ounces of 5% bleach per gallon of stock solution proportioned at one ounce per gallon). Continue flushing until chlorine smell is gone. Test the water in the lines to make sure it contains no more than 5 ppm of chlorine.

Step Six: Keep the System Clean

Once the system has been sanitized, it is important to keep it clean. Develop a good daily water sanitation program for your birds. The ideal water line sanitation program should include injecting both a sanitizer and an acid. It is important to note that the procedure requires two injectors since acids and bleach should never be mixed in the same stock solution.

If only one proportioner or injector is available, then inject bleach (concentration of 5%) at a rate of 4 to 6 ounces/gallon stock solution; proportion at 1 ounce of stock solution per gallon of drinking water.

The objective is to provide a clean source of drinking water with a continuous level of chlorine at 3-5ppm at the end of the building furthest from the proportioner.

Final Notes:

1. Do not use acid as the sole method of water treatment since acids alone can cause bacterial or fungal growth in water systems.
2. When administering other products to your birds it is a good idea to stop the inclusion of chlorine (and other sanitizers) in the drinking water. Chlorine will inactivate vaccines, and reduce the effectiveness of some medications. Resume use of chlorine and/or other sanitizers after treatment is finished.

Aviagen Turkeys thanks Dr. Susan Watkins from the University of Arkansas for her contribution to this article and for her work with the turkey industry on developing water sanitation programs.

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