

# Practical Steps To Clean Water

Here's step-by-step advice on how to clean water lines so that they do not harbor microorganisms that can hurt your birds. by Terrence O'Keefe

**P**roviding a clean, safe and sanitized water supply is vital for flock health and good bird performance, according to Susan Watkins, poultry extension specialist at the University of Arkansas. Dr. Watkins spoke at U.S. Poultry & Egg Association's Poultry Production and Health Seminar.

Before implementing a daily water sanitation program, it is important to thoroughly clean as much of the water distribution system as possible, Watkins told listeners. Line cleaning is necessary before providing birds with sanitized drinking water because even



Dr. Susan Watkins at the Poultry Production and Health Seminar

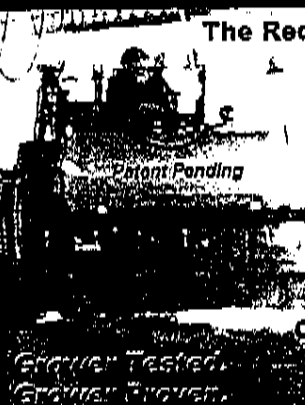


Cleaning the entire water system before the chicks arrive helps remove biofilm and scale build-up that can act as a food source and hiding place for harmful pathogens.

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## ➤ Practical Steps To Clean Water

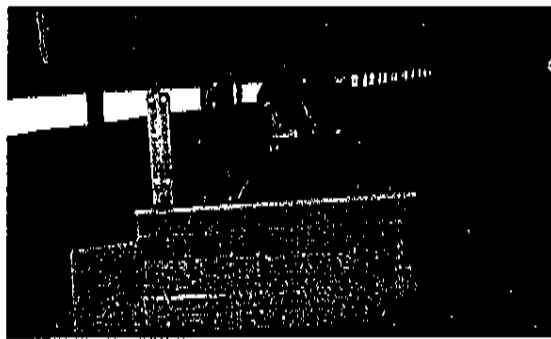
low levels of sanitizer placed in dirty water lines can result in the biofilm sloughing off, and this can clog drinkers and restrict the amount of water actually getting to the birds. Watkins also said that sanitizers added to the drinking water can react with biofilms in the water lines and produce off tastes which can decrease water consumption and hurt performance.

Effectively cleaning the entire water system, including the drinker lines, before

the chicks arrive, helps remove biofilm and scale build-up that can act as a food source and hiding place for harmful pathogens such as *E. coli*, *Pseudomonas* or even salmonella. Many disease-causing organisms like salmonella can live for weeks in water line biofilm resulting in a continuous source of contamination. In addition, proper line cleaning can help prevent calcium deposits or scale build-up which can reduce pipe volume by as much as 70 percent to 80 percent.

In order to make sure that lines are effectively cleaned, consider the source of the water, the mineral content of the

**Line cleaning is necessary before providing birds with sanitized drinking water.**



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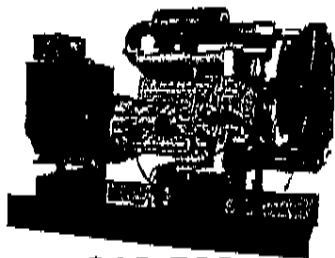
water, the products that have been used in the water lines and any recurring health problems on the farm. Watkins said that untreated well water is the most vulnerable to the formation of slime or biofilm in the drinker lines. While most municipal or rural water supplies contain a minimum of 0.2 ppm free chlorine, which greatly reduces bacteria growth, poultry drinking water is handled differently from the water supply that goes to a home, because of the slow flow and the warming that occurs during brooding of the chicks. It is unwise to assume that cleaning of drinker lines is not needed, she stressed.

Calcium and magnesium are the sources of scale, the hard, white build-up frequently found in the presence of hard water. According to Watkins, if the water supply contains more than 60 ppm of either or both these minerals, and the water pH is above seven, chances are good that there is scale in the water system, which will have to be removed with an acid cleaner designed for nipple drinker systems.

Other common mineral contaminants are iron, manganese and sulfur. Iron results in a rusty, brown-to-red-colored residue, while manganese and sulfur can form black-colored residues. Natural sulfur in the water has a smell similar to a match head. If the water smells like rotten eggs, then the culprit is hydrogen sulfide, a by-product of sulfur-loving bacteria, and the lines will need to be cleaned with a strong sanitizer. It might even be necessary to shock chlorinate the well. She said that if the filters at the

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might be effective in removing biofilm, the potential damage it can do to the regulators and nipple drinkers makes this a poor option, and the same is true for many cleaners that might otherwise be good poultry barn disinfectants. Iodine is not very effective against biofilms so it makes a poor choice," she said.

There are several sanitizer products

available for cleaning drinker systems, but Watkins said that some of the most effective products which are not damaging to the drinker systems are the concentrated, stabilized hydrogen peroxides. The active ingredients in these products are different from over-the-counter hydrogen peroxide, because the stabilizer keeps the sanitizer from converting to water and oxygen

before it finishes the cleaning job.

There are also several chlorine dioxide products available, but they are most effective if an acidifier is present, which may require dual injectors or a way to safely mix the products prior to injection.

A third product used by the industry is household ammonia. A test on algae showed that running one ounce of

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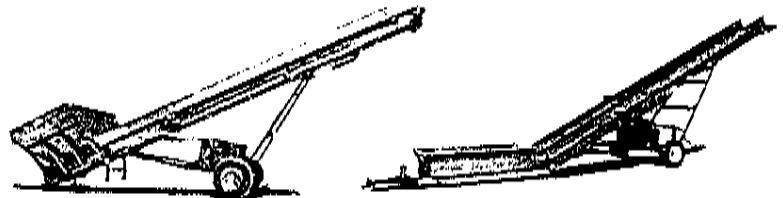
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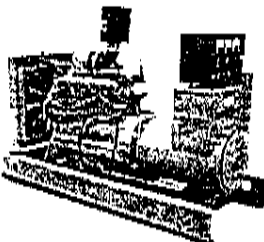
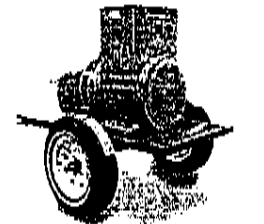
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beginning of the water lines are rusty or black colored, then a strong acid cleaner should be used after the sanitizer flush.

If additives such as vitamins, electrolytes, sugar-based products, mineral-based performance enhancers or weak concentrations of water acidifiers have been used frequently, then chances are a biofilm is present in the water lines. She said, "Once a biofilm is established in a water system, it makes the system 10 to 1000 times harder to clean. It is important to play it safe and use strong sanitizer cleaners."

The health history of the farm should be considered when cleaning the water lines. If there have been health issues flock after flock such as *E. coli*, necrotic enteritis

or respiratory challenges that did not respond to good management, clean-out or down-time, then the organisms causing these problems may be hiding and thriving in the water supply, particularly the water regulators and drinker lines. "Cleaning with a strong sanitizer is definitely an option that might help," she said.

After identifying the type of cleaning

that will be most beneficial, the next step is to choose a product that will not damage the equipment, Watkins said.

"Currently there are several acid products that can be used for scale removal. Just remember that in order for the product to be effective in removing scale, it needs to drop the water pH below 6. While a strong bleach solution

**Proper line cleaning can help prevent calcium deposits or scale build-up which can reduce pipe volume by as much as 70 percent to 80 percent.**



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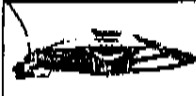
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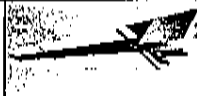
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## *Some of the most effective sanitizers, which are not damaging to the drinker systems, are the concentrated, stabilized hydrogen peroxides.*

ammonia in every gallon of water is not nearly as effective as a 3 percent ammonia solution. Watkins strongly recommended that the equipment manufacturer be consulted before using this.

The most important fact to remember is that biofilms or established growth of bacteria, molds and fungus in water systems can only be removed with cleaners that contain sanitizers, and these should be products at concentrations that will not damage the equipment. Watkins stressed that everyone should pay close attention to any product safety recommendations and follow them accordingly.

The time to clean the water lines is after the birds are removed from the house, according to Watkins. She said that step one is to flush the lines with water, using high-pressure water, if possible. This step removes any loose sediment from the lines. It is important to make sure the standpipes are working properly to assure any air build-up that may occur during the cleaning process will be released from the lines.

Next, determine how the cleaner will be injected. If a medicator is used, Watkins advised, it may not provide the concentration of cleaner required; therefore, use the strongest product available to overcome the dilute injection rate of the medicator. An effective alternative using a medicator is to mix the cleaner in a 55-gallon barrel and then use a sump pump to charge the product either into individual lines or through the water tap where the medicator attaches to the water line. A third option is to pump the cleaner from the well room through an injector or medicator.

Watkins said it is a good idea to start cleaning at the well house, because the water lines going to the poultry house can be a source of contamination. She said this can be a bad idea if the distribution

lines are very dirty, since cleaning them will send the filth into the poultry house water lines. Only use this option if there is a faucet in the poultry barn that can be used to flush the water lines before water reaches the nipple drinker lines, she advised.

Use a broom to sweep the nipple drinkers in order to get the cleaning

product down into the drinkers, she suggested. Once the drinker lines are filled with the cleaning solution, let it stand as long as possible - 72 hours is ideal. Watkins recommends checking with the product manufacturer to assure the soaking time will not damage the equipment. After the lines are cleaned, if mineral build-up is an issue, then re-clean the lines with the acid cleaner.

Finally, Watkins said, "Cleaning the water lines between flocks is only half the battle. Even with a thorough cleaning, if a significant number of bacteria, fungi or yeasts are still present, then the biofilm has the potential to return completely in two to three days. Therefore, the last step is to establish a daily water sanitation program. This will benefit both the birds and the water system." **PT**