

Water – the fatal flaw in your biosecurity?

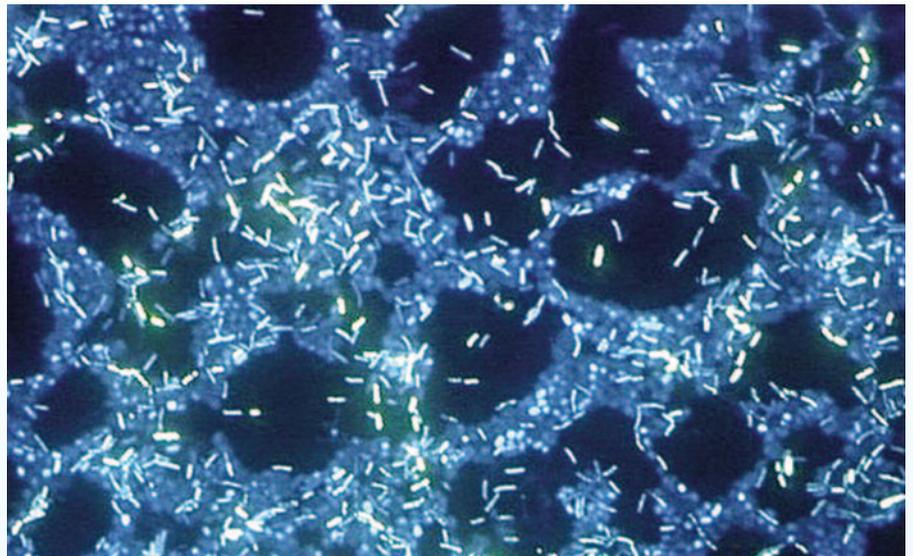
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Most of the literature on developing biosecurity programmes counsels poultry producers to limit access to their farms. The discussion usually centres on preventing disease causing organisms from entering the farm on vehicles, on visitors' clothing or in wild birds. Little discussion, however, is given to the potential for disease to spread through the watering system.

This is unfortunate because water for any poultry operation is a constant source of unwanted pathogens. Any biosecurity system that is truly successful will include extensive prophylactic measures involving the water supply and watering system.

Source of your water

First consider the source of the water. If you get your water from an open source, such as a river, pond or reservoir, you are most likely watering your birds with contaminated water. Open source water is exposed to whatever is in the environment, including insects, animals, faeces and other birds.



Polymicrobial biofilm grown on a stainless steel surface in a laboratory potable water biofilm reactor for 14 days, then stained with 4,6-diamidino-2-phenylindole (DAPI) and examined by epifluorescence microscopy (picture courtesy of Ricardo Murga and Rodney A. Donlan, 2002. *Emerging Infectious Diseases*, Vol 8, No 9).

Most poultry operations draw their water from wells. While well water generally is considered safe, it is wise to have it tested on a regular basis for a variety of contaminants.

Groundwater changes over time and that means the quality of water in the well changes.

The most common source of well contamination comes from rainwater runoff. All too often, farmers locate wells without considering the nearby sources of contamination.

For instance, run-off from animal feedlots or stacked litter outside the poultry house can contaminate the well.

Abandoned wells represent another threat. If you do

not properly cap the abandoned well, it becomes a direct conduit to the groundwater.

Biofilm contamination

Regardless of where you get your water, another concern you have to face is water that actually becomes contaminated while inside the watering system through a substance called 'biofilm'.

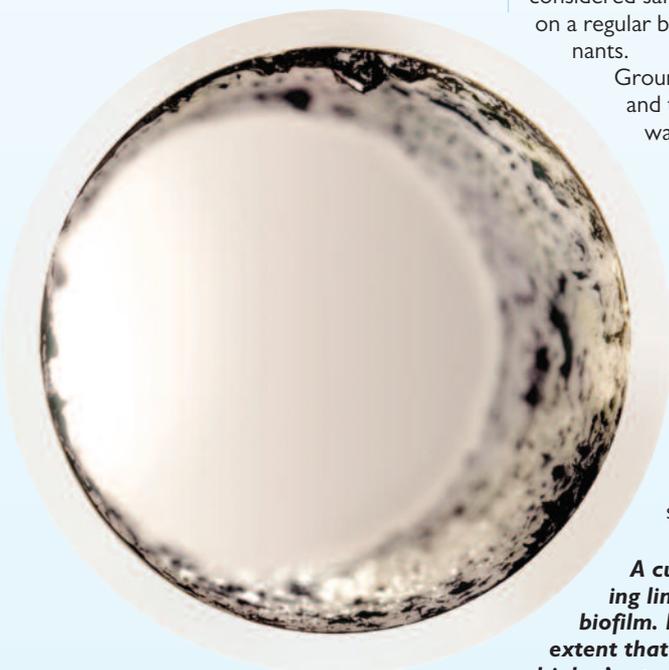
Biofilm occurs when bacteria attach to the pipes' walls in a drinking system, creating a sticky substrate. As producers introduce interventions of medications and vitamins, bacteria find an ideal breeding ground in glucose and other nutrient-enriched bases used for the interventions.

Additionally, enclosed watering systems operate on low pressure, providing little turbulence to dislodge this buildup.

As the biofilm grows, portions can break off and the birds can consume it. Besides bacteria, biofilm can become the home to viruses and anything else in the water.

Producers will commonly introduce chlo-

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A cutaway section of a watering line showing an active biofilm. Biofilm can grow to the extent that it interferes with a drinker's operation.

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rine or other sanitising agents into the system to kill bacteria. This practice, however, is very ineffective against biofilm. Research shows that bacteria embedded in a biofilm are much more resistant to chlorine than when free floating. In addition, chlorine cannot break up biofilm.

To combat biofilm, producers must find a way to break it up. Ziggity Systems recommends a regular schedule of high pressure flushing with 1.5-3.0 Bars (20-40psi.) pressure.

An additional and highly effective tool for eliminating biofilm is a hydrogen peroxide based cleaner.

Properly formulated, hydrogen peroxide

is a powerful oxidising agent. The oxidising action scrubs the interior of the pipe clean of biofilm, making the system ready for flushing.

An added benefit is that hydrogen peroxide breaks down into water and oxygen, producing no environmental hazard.

When applied as directed, it does not harm the birds, or impact the taste of the water. Sanitising agents, such as chlorine, can alter the water's taste to the point where the birds will not drink, hurting feed conversion.

Producers can take much of the labour out of flushing lines by installing automatic flushing equipment. If your poultry operation uses a water tank, sometimes called a

header tank, it is another source of potential contamination. Water tanks, by their very nature, are open systems.

The tank must have a vent to allow air in and out as the water level within the tank changes. But, this vent opens the tank to any pathogens in the air, as well as mould spores, insects and even small animals. These contaminants can adversely affect your flock's performance.

A screen covering the air vent can stop insects, animals and foreign objects from getting into the tank.

However, a screen cannot stop pathogens and mould spores, which add to whatever contaminants, such as sediment and chemicals, are already in the water.

Avoid 'chemical soup'

Many of the contaminants sink to the bottom of the tank where a type of chemical soup brews. Again, these contaminants threaten bird performance.

To avoid giving this chemical soup to your birds, make sure the outlet valve for the pipe leading from the water tank to the poultry house is at least 5cm (about 2") above the tank floor.

Also, a filter right before the water line enters the poultry house can remove many of the suspended solids and sediment in the water. The filter should have at least a 5-10 micron cartridge.

Finally, you must manage your watering system to keep your litter in friable condition. Wet litter conditions encourage pathogens to grow. Among the more serious diseases fostered by wet litter are avian influenza, gangrenous dermatitis, Newcastle disease, Gumboro, botulism, colisepticaemia and salmonellosis. Wet litter also encourages coccidiosis.

Wet litter attracts flies and rodents. Both pests carry diseases that can be transmitted to the flock. In addition, rodents can become a direct threat to the actual birds.

Determining litter condition

The best way to quickly determine litter condition is to grab a handful near a drinker and squeeze. If the litter clumps together in a ball, it is too wet. If the litter falls apart immediately, it is too dry, creating dusty conditions that can harm production.

If the litter is friable, it clumps briefly and then crumbles apart and has the correct moisture content of about 20-25%. It is becoming more and more necessary for poultry farmers to establish strict biosecurity programmes to protect their flocks and their income from diseases.

No biosecurity programme is complete, however, if it does not take into account the watering system. An unexamined watering system can become the source of deadly pathogens that can harm your birds and your production. ■