

The challenges of gravity controlled water tanks

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For a poultry flock to thrive, it must have access to a constant supply of fresh, clean water. Today's watering systems, like Ziggity's enclosed nipple type drinkers, help keep the water clean as it is delivered to the birds.

However, in many parts of the world, unreliable electricity to operate pumps and intermittent water supplies make it a challenge to use enclosed systems. Poultry farmers worldwide have discovered that gravity controlled water tanks provide an excellent solution to the challenges of unreliable electrical power and intermittent water supply.

But, gravity tanks bring their own set of challenges. Here are ways to overcome the five most common challenges of operating gravity controlled water tanks:

1. Ensuring the water flowing to the birds is sanitary

Providing your birds with fresh, clean water remains one of the most daunting tasks you face. Water is a natural habitat for a variety of pathogens, and in its role as a universal solvent, water picks up much of what it comes in contact with.

The first source of contamination is your water supply. There are three basic sources for water – ponds or streams, bore holes or wells and municipal water systems. Open sources like ponds and streams are least desirable.

The condition of the water changes rapidly and frequently. You have no control over what is dissolved in the water. Wells are a common source of water for poultry farms. They are relatively reliable, but they require energy, usually electricity, to operate the pumps. Any irregularity in the energy supply interrupts the water supply. Municipal water systems are usually clean and usually provide the pressure an enclosed watering system requires.

However, in many parts of the world, they are unreliable or unavailable.

Gravity controlled water tanks compound the threats to water quality. 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.

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 inlet valve for the pipe leading from the water tank to the poultry house is at least five centimetres (about two inches) 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.

It is a good practice to regularly drain the tank and clean out the accumulated debris in the bottom of the tank. You can do this in conjunction with cleaning the walls of the tank, which is discussed in the section of this article dealing with biofilm.

2. Using the watering system for interventions

Many poultry farmers use their watering system to provide medications and vitamins to their flocks. The watering system allows producers to administer the interventions to large numbers of birds efficiently.

One common method for administering these interventions is to mix the medication in the water tank. This practice poses a number of problems. The most obvious is the actual act of dumping medication into the tank,

where you risk a serious fall trying to climb to the top of the water tank, carrying the medication. And, once you put the intervention into the tank, you need to thoroughly mix it with the water.

Another concern is how the intervention will react to the chemical soup at the bottom of the tank. The soup may harbour materials that will render the medication ineffective. For instance, zinc will leach from the walls of a galvanised steel tank over time, and zinc deactivates a common antibiotic administered for *E. coli*.

The ideal solution is to employ a water-powered medicator. Ziggity recommends checking with the manufacturer to determine the amount of water pressure a particular medicator needs. Some medicators require more pressure than provided by many gravity systems.

3. Biofilm forming in the tank, as well as in the watering system

You may know about the threat that biofilm poses to your watering system, but it also represents a problem for the water tank.

Biofilm forms when bacteria attach to a solid surface in water and exude a sticky, nutrient rich slime. That slime attracts additional bacteria and quickly becomes an active colony of pathogens. This colony can grow quite large because there is nothing in the tank to disturb it.

Additionally, most water tanks are exposed to the sun, which can heat the water and encourage additional bacterial growth. Bacteria in the biofilm, and even sections of the biofilm, can break away from the colony and enter the watering system.

The bacteria can harm bird performance and the sections of biofilm can interfere with system performance.

Ziggity recommends draining the water tank on a regular basis and power washing the interior. Often, however, the power wash and scrubbing are insufficient to eliminate the biofilm. In these cases, you may have to resort to a chemical wash.

Ziggity also recommends regular high pressure flushing to clean the watering system. Hydrogen peroxide based cleaners have proved effective at scrubbing the system free of biofilm.

4. Maintaining the correct pressure in the system

A primary reason to use a gravity controlled water tank is to ensure the water going to your poultry house has sufficient pressure. The amount of pressure in the system is directly dependant on the height of the tank.

A water tank must be 10 metres (33.35 feet) above the water line in the poultry house to produce one bar (14.5 psi) of pressure. Since enclosed watering systems like Ziggity's operate on low pressure, a rooftop tank can provide sufficient elevation.

However, when it is time to flush the watering system, you need greater pressure. Generally, you will need 1.5 to 3.0 bars of pressure (about 20 to 40 psi) to generate sufficient turbulence to break up any biofilm in the drinking system and to blow away any sediment deposits.

To achieve this pressure you need a water tower that is 15 to 30 metres (50 to 100 feet) above the watering line.

5. Regulating the temperature of the water

A final consideration is the temperature of the water. The water tank is directly exposed to the sun. In many parts of the world where water tanks are necessary, the daytime temperature can exceed 35°C (95°F) by mid-day.

The water in the tank will heat up to a temperature that encourages additional bacterial growth.

Gravity controlled water tanks offer a good strategy to overcome erratic power and water supplies.

However, gravity tanks and their operation require the same diligence watering systems do.

By paying attention to these details, you can ensure quality bird performance flock after flock. ■