

Common Mistakes Made In a Water Program

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Don't You Get Tired Of Hearing About Water?

Over and over.....

- Take a bacteria test
- Take a mineral test
- Clean your water lines
 - Treat your water

Then when it doesn't work what do we do?

We jump to the next product or system or worse, we just quit doing anything at all.



Guess what? It's going to happen again with the next product or the next flock because we don't go through the steps needed to make the product work or follow up on the understanding of how to use it



We Were On A Farm Recently That Had 4 Different Water Treatment Systems They Had Tried – None Of Which Were Functioning



You don't have to start with the hardest step

WHAT EVERYONE KEEPS DOING:

- First thing every company wants to tell you to do is **TAKE A BACTERIA TEST**
- How are you going to do that? Where do you get instructions? How in the world are you going to get a sterile container? Are you really going to ship it overnight to a lab? What are you testing for?

TRY THIS INSTEAD:

- If the water lines have not been cleaned AND the water is not being treated, they have bacteria.
- Gather information to make a plan to clean water lines and treat water



Sometimes it's obvious.....

What is that in my water line?



This is a **yeast** growing in this water line. The grower was injecting an organic acid and an electrolyte – both a source of food for several kinds of organisms

What is that in my water line?

This is a *pseudomonas spp.*

and mold

Supplements “feed” all kinds of organisms in the water system



What is that in my water line?

This is **Algae** that was flushed from a water line

Acid products set up a great environment for Algae and Molds



Proxy-Clean Products 2022



What is that in my water line?

Mold being flushed out of a water line

Organic acids had been continuously used



Sometimes it's not so obvious.....



The swab of this water line looks clean but contains millions of bacteria (over 300 Million cfu/mL to be more precise)

Different kinds of bacteria produce different kinds of biofilm

If you have done all the work to
clean water lines and treat water
but there has been no
improvement in performance,
THEN is the time to dig deeper

Have A Plan If You Do Need To Take Bacteria Tests Down The Road

- Find a lab that knows what you are talking about! (Hardest Part!!)
- Instruction sheet – contact us (Proxy-Clean® Products) or the University of Arkansas Central Analytical Lab
- Test the well and the water lines
- Video for sample collection done by the University of Arkansas just Search YouTube for **“How to Collect a Drip and Swab Sample”**

Laboratory Procedure for Collecting Drip Water Samples from a Poultry Drinker Line

1. Label Whirl-pak bag with Barn number and a way to identify the line the sample was taken from (ie – far south line, or line #1).
2. Use alcohol wipe to thoroughly clean tweezers. It is recommended that the tweezers then be flamed, but this may not be safely performed if inside a poultry barn.
3. Use the same alcohol wipe to thoroughly clean the nipple on the drinker line.
4. Use the sterile tweezers to push up on the nipple and allow water to flow from it for approximately 15 seconds.
5. While the water is still flowing, open the whirl-pak bag and fill it about ¼ of the way full, being very careful not to touch the bag or the tweezers to anything else.
6. Seal Whirl-pak bag and place in cooler on ice pack. Repeat procedure for any other lines you would like tested.
7. Keep all samples on ice or in fridge until shipping.
8. Ship samples with cold ice pack overnight to laboratory for testing.
9. Samples must be kept chilled until they reach the laboratory for testing.

Be sure to label your samples so you can identify which sample is which when you receive the results.

If doing swabs for a biofilm, as well, do the swab on the same line you just took the drip sample from and always do the drip sample first.

YouTube



If Well Samples Come Back With High Bacteria Counts:

- Time to shock the well
- Use a product called “Well Safe”
- Follow printed instructions or visit their YouTube channel
- Do not pour liquid bleach down into the well head
 - Damages well components
 - May not be effective due to pH
 - Breaks down very quickly



Mineral Tests are Useful Right off the Bat!!

WHAT EVERYONE KEEPS DOING:

- Taking a mineral sample and getting it analyzed
- Getting the results and not having a clue what they mean
- Sticking it in a filing cabinet

TRY THIS INSTEAD:

- Search for previous mineral tests that have been performed
- If they are more than 5 years old get new tests done
- Consult the standard acceptable levels for poultry water- not human acceptable standards
- Develop a plan



University of Arkansas' guidance on minerals specifically for our industry:

Mineral Interpretation Chart

Contaminant	Levels Considered Average	Maximum Acceptable Level	Comments
pH	6.5 to 7.8	5 as minimum/8 as maximum	pH below 5 can be harmful to drinker equipment-causing corrosion to metal components with long term exposure. pH above 8 impacts effectiveness of most water sanitizers and if the high pH is also associated with high alkalinity may result in reduced water consumption in poultry due to "bitter" taste.
Total Hardness	60 – 110 mg/L	110 mg/L	Hardness can also be determined by adding the Calcium and Magnesium content. Hardness causes scale which can reduce pipe volume and cause drinkers to be hard to trigger or leak,
Natural Elements			
Calcium (Ca)	60 mg/L		No upper limits for Calcium. Birds are very tolerant of Calcium but if the value is above 110 mg/L it may require a water softener, polyphosphates or acidifier to prevent scaling.
Magnesium (Mg)	14 mg/L	125 mg/L	Higher levels of Mg may cause flushing due to a laxative effect, particularly if there are high sulfates present as well.
Iron (Fe)	0.2 mg/L	0.3 mg/L	Birds are tolerant of the iron metallic taste but high iron causes leaking drinkers and promotes the growth of several bacteria, including E. coli and pseudomonas. Treatment would include oxidation with Hydrogen Peroxide, Chlorine, Chlorine dioxide or ozone + filtration. Green Sand filters are also a good solution.
Manganese (Mn)	0.01 mg/L	0.05 mg/L	Can result in black grainy residue on filters and in drinkers and cause leaking drinkers. Treatment includes oxidation with Hydrogen Peroxide, Chlorine, Chlorine dioxide or ozone + filtration. Again, Green Sand filters are a good solution.

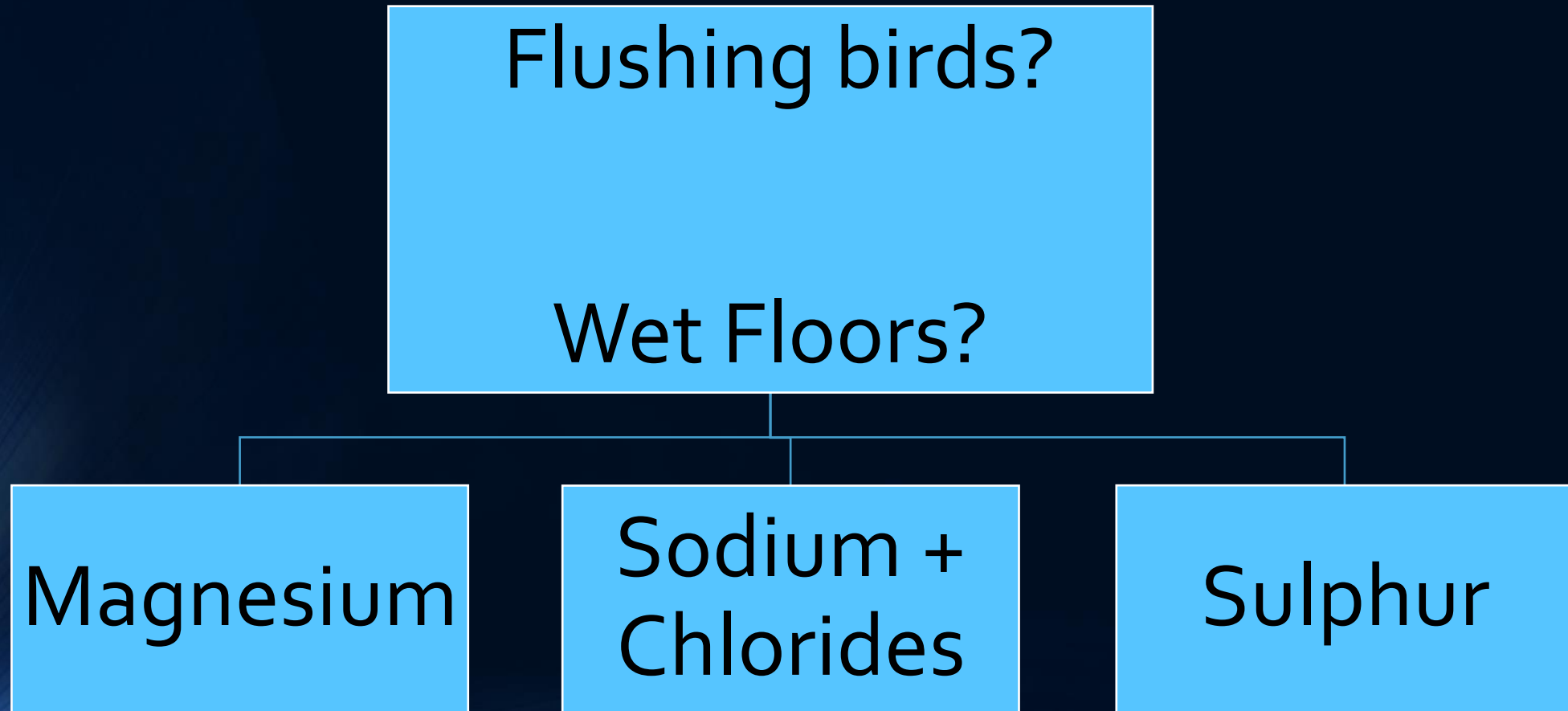
Contaminant

Levels Considered
AverageMax Acceptable
Level

Silica (Si)	5 to 20 mg/L		Although it is not identified as a health issue, it can be troublesome for equipment and often clogs filters and jams drinkers. In most cases it can be treated through oxidation with Hydrogen Peroxide, Chlorine, Chlorine dioxide or ozone + filtration. Again, Green Sand filters are a good solution. Some forms of Silica, however, may require Reverse Osmosis.
Chloride (Cl)	50 mg/L	150 mg/L	When combined with high sodium levels creates salty water that can act as a laxative causing flushing. Salty water can also promotes the growth of enterococci organisms that lead to enteric issues. This water condition can be treated with Reverse Osmosis, lower dietary salt levels, a process of blending the contaminated water with non-saline water. This condition needs particular attention to keep the water clean and use a daily sanitizer such as Hydrogen Peroxide or Iodine to prevent microbial growth.
Sodium (Na)	50 mg/L	150 mg/L	When combined with high chloride levels creates salty water that can act as a laxative causing flushing. Salty water can also promotes the growth of enterococci organisms that lead to enteric issues. This water condition can be treated with Reverse Osmosis, lower dietary salt levels, a process of blending the contaminated water with non-saline water. This condition needs particular attention to keep the water clean and use a daily sanitizer such as Hydrogen Peroxide or Iodine to prevent microbial growth.
Sulfates (S or SO4)	15 – 40 mg/L	200 mg/L	Sulfates can cause flushing in birds. If a rotten egg odor is present then bacteria producing Hydrogen Sulfide are also present and the well must be shock chlorinated and the water system thoroughly cleaned with the establishment of a daily water sanitation program. Sulfates can be removed by aerating water into a holding tank, treating it with a sanitizer then filtering.
Nitrates (NO2 – NO3)	1 – 5 mg/L	25 mg/L	High nitrate levels can result in poor growth and feed conversions. The presence of Nitrates can also be an indicator of fecal bacteria. Removed with Reverse Osmosis.
Lead (Pb)	0 mg/L	0.014 mg/L	Long term exposure can cause weak bones and fertility problems in breeders and turkeys.
Copper (Cu)	0.002 mg/L	0.6 mg/L	Copper can make water taste bitter. It can also cause intestinal irritation.
Zinc (Zn)		1.5 mg/L	Upper limits can cause anemia and result in poor bird performance.

Sources: www.epa.gov/safewater/contaminants/index.html

Minerals and the Negative Impact on Bird Health



Minerals and the Negative Impact on Bird Health

Decreased
Consumption of
Feed and Water?

Zinc
(astringent)

Iron
(bitter)

Copper
(bitter)

If the iron is in its "dissolved" form, you can not see it or any of these minerals in the water or on the filter



Minerals and the Negative Impact on Bird Health

Poor growth, weak bones,
intestinal irritation?

Nitrates

Lead

Copper

Are minerals building in the water line?

Can You Scrape Flakes off the Cups or Drinker Pins?

Crusty build-up inside and out?

That would be mineral scale and you can use an equipment friendly acid to descale water lines when the house is empty



.....and if you can see it on the drinkers, odds are it's everywhere else, too!

Pressure Issues



Water Volume Reduction



Clogged Drinkers

Jammed Medicators



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When there is scale you wind up with 2 challenges: equipment malfunction and the inability of water treatment to be its most effective

Scale can hide communities of bacteria, yeasts, molds, fungi, algae and viruses

Look at all the crooks and cranny's they can hide in and under where water
treatment may not be able to reach the organics



Mineral Tests Are Easy To Collect!

- Don't need a sterile container
- Does not have to be kept cold
- Collect as close to the well as possible



The Results of the Mineral Tests May Have You Using Acid Products

WHAT EVERYONE KEEPS DOING:

- Adding the least expensive acid
- Adding the acid you found in the anteroom

TRY THIS INSTEAD:

Ask yourself why the acid is being added:

- Lowering pH for water uptake or solubilizing minerals?
Add Inorganic Acid
- Tightening gut for a specific health issue?
Add Organic Acid



What Is Your Goal When Using An Acid?

Inorganic acid – used for lowering pH of water

Organic Acid – used for bird health

- * Organic Acids allow for the growth of Yeasts, Molds, Algae and some bacteria in the water system

Unfortunately, this grower thought they were “treating” their water when they used Citric Acid during the flock



Both Of These Growers Were Using Citric Acid (an organic acid): One Had Mold In The System, One Had Bacteria And Yeast In The System



- Whatever is in the barn can wind up in the water system
- We provide the perfect conditions for growth
- THEN we kill off the most aggressive competition with an acid
- The organic acid then becomes a food source for those that remain



If you **HAVE** to use organic acids, be sure to follow it with an oxidizing water treatment (Hydrogen Peroxide or a Chlorine based product)



All A Result Of Acid Use And No Water Treatment



Side Note About Acids:

- **Acids used with chlorine products** can damage the water line equipment

Now, you may think that's not a problem if all you are using is an acid, but **many acids on the market have a Hydrochloric Acid component to them which does INDEED have the chloric ion** that, over time, can remove the oxidized layer of your stainless steel components in a low pH

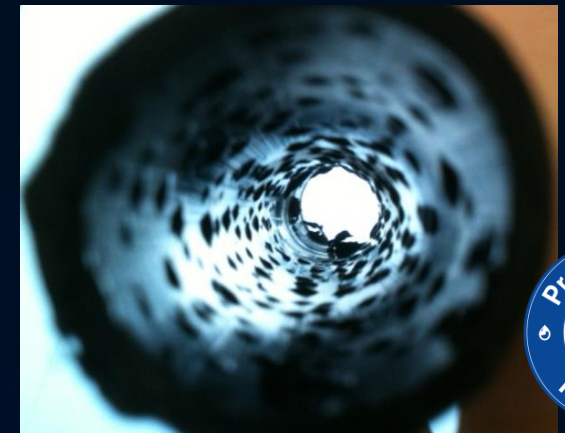
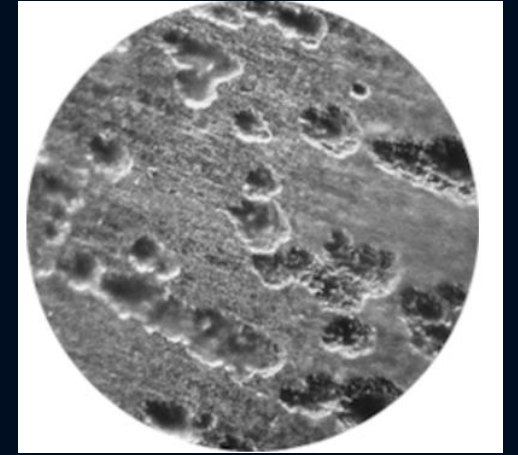
- In fact, there are water line manufacturers that will void the warranty if the equipment is exposed to:

“aggressive chlorination and/or acidification programs (greater than 1 ppm and/or pH less than 6)”



So, if you plan to use an acid long term to lower pH (Inorganic):

look for an acid that is chloride free. These are more equipment friendly. Hydrochloric Acid, for example, contains chlorides that can remove the protective oxide layer of stainless steel



The background features a dark blue field with a series of curved, parallel lines that create a sense of depth and movement. On the right side, these lines curve inward to form a tunnel-like structure. The walls of this tunnel are covered in a fine, light blue grid pattern, which becomes more prominent as it recedes into the distance. The overall effect is a dynamic, futuristic, and somewhat ethereal visual.

Are The Products
Being Used Correctly?

When you walk into this anteroom you'd sure think the grower was on top of his water treatment.....

But he was actually overwhelmed



We Switch Products When The Real Problem May Just Be Incorrect Usage

- Don't feel like you automatically have to have a chemistry degree to understand how your system works. Any reputable company will have a representative there to explain it and teach you how to use it. Ask questions. Ask to be involved.
- Liquid Chlorine + Acid, Gas Chlorination, Chlorine Dioxide, Hydrogen Peroxide all have different steps that make them more effective.
- Call a company representative if you need to. Maybe everyone just needs a refresher on how to keep the system functioning.



How Is The Product Being Measured? It Can't Be Successful If It Isn't Being Used As Designed

- Ask the company representative what should be used to measure residual
- Measuring Chlorine? Be able to measure for FREE chlorine – that's the chlorine that is available for oxidation (Total chlorine measures free + chlorine that is already bound) This kit from HACH measures free and total chlorine
- If you use a pool test kit be sure you get one that measures free chlorine



Hach Total and Free
Chlorine
@\$140



If You Use A Pool Test Kit Be Sure You Get One That Measures Free Chlorine

THIS ONE TESTS FOR FREE CHLORINE
(@ \$100)



AND THIS ONE DOES NOT
(@ \$17)



How Is The Product Being Measured? It Can't Be Successful If It Isn't Being Used As Designed

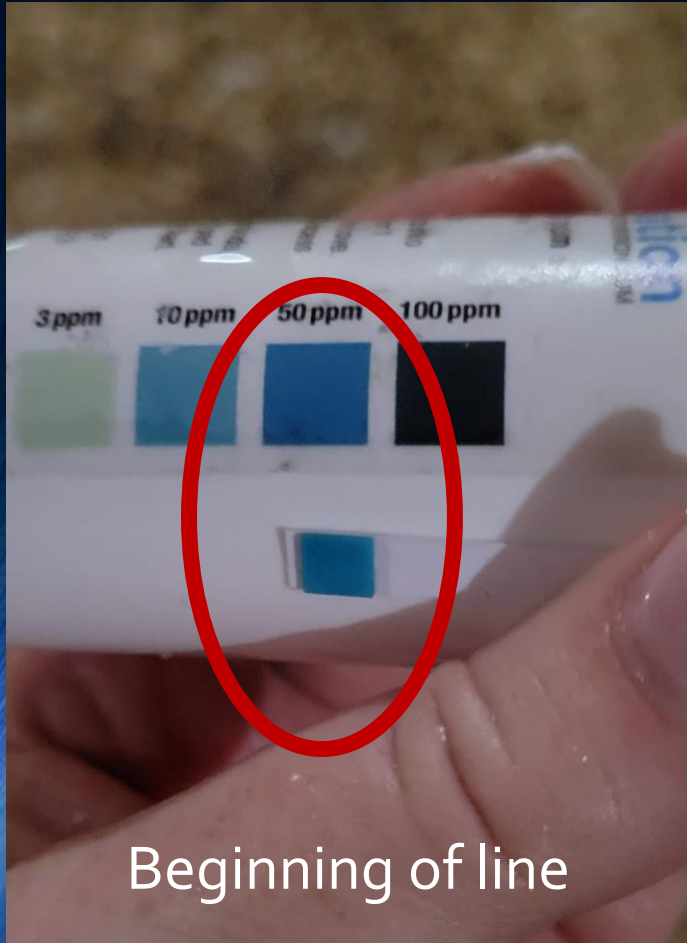
- Measuring Hydrogen Peroxide? Use unexpired test strips

or

- Use a titration type Hydrogen Peroxide test kit



Do Your Lines Still Have a Buildup?



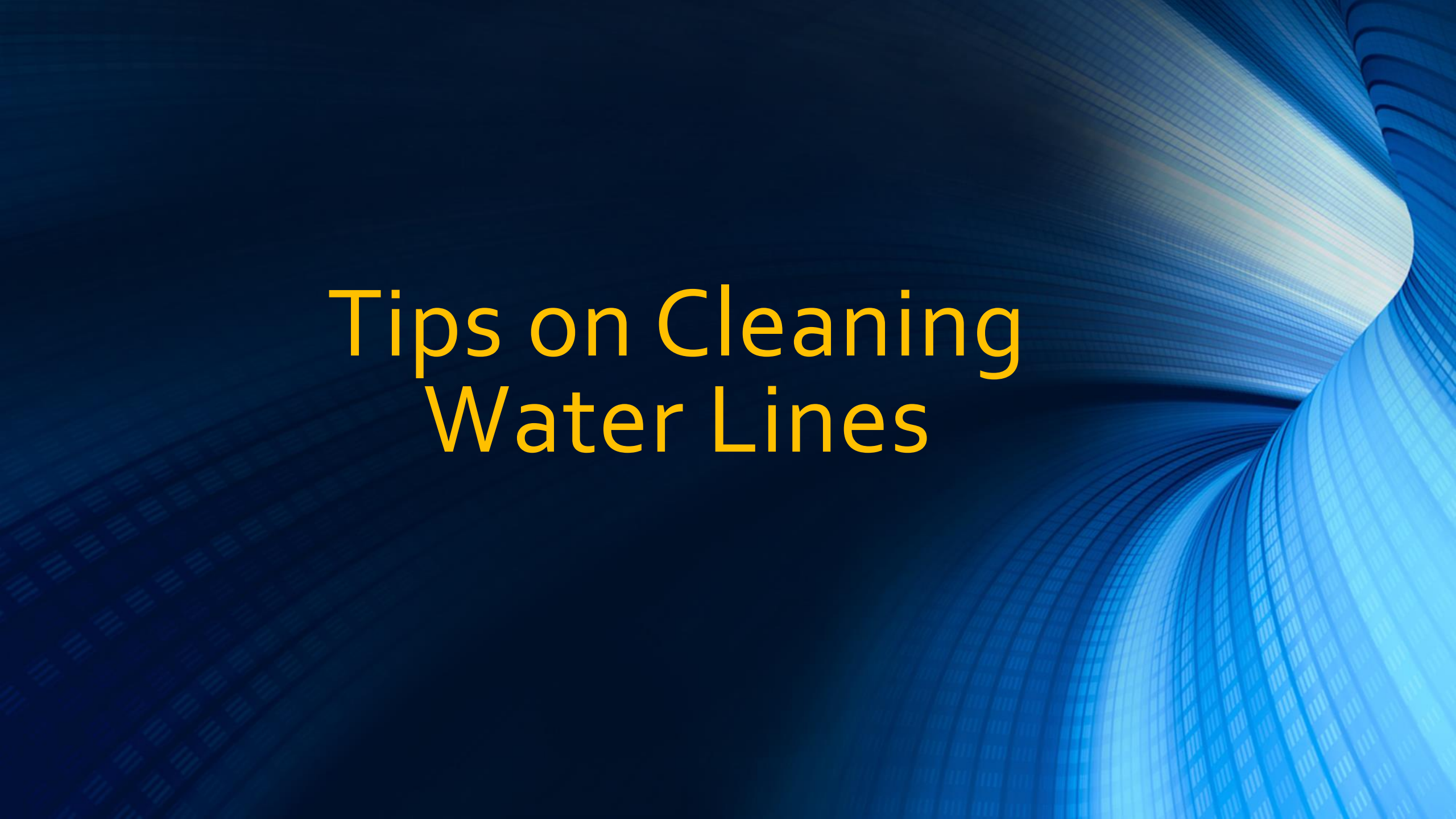
Beginning of line

Good way to see if your oxidizer is being used up completely before it reaches the end of the water line

This line still has an organic buildup



End of line

The background features a dark blue gradient on the left that transitions into a bright blue, glowing tunnel-like structure on the right. This structure is composed of numerous thin, parallel lines that curve and converge, creating a sense of depth and movement. The overall effect is a futuristic, digital aesthetic.

Tips on Cleaning Water Lines

Do You Know How To Clean Water Lines?

- All of us, at one point, did not know how
- Search for video on the manufacturers website and on YouTube
- There are several of us that are available to come onto the farm and train anyone



Have a Plan – Write it Out If You Need to

Ask yourself these questions to see if you are prepared:

- What product am I going to use?
- How do you plan to get it into the water line?
- How much of that product do I need?
- How long will I leave it in the water line (always check label)?
- When will I do this?

(and, no, just drying out the lines does not kill all the bacteria or viruses)



Making a Plan:

- Best time to clean water lines is a few days before bird placement
- Leave time for product to sit recommended amount of time
- Leave a day to completely flush the lines and set them up for placement
- If the lines have never been cleaned or if it has been several years, the lines may need repeated cleaning



Are You Prepared to Clean Water Lines?

Most products call for a 3% solution going into the water lines for cleaning purposes (medicators put in 0.78%)

A typical, **500 ft house** takes about 2 gallons of product at the 3% level to fill the lines

So, If you have 4 houses you're going to need about 8 gallons of product to cover those 4 houses

(A larger 660 foot house can use 3 to 5 gallons of product at the 3% level)



Don't Just sit in the anteroom and assume product is making it into the water line. Go check.

Look for bubbles
If it's a Hydrogen Peroxide Product



Or look for a
Color change

Most products
can have a
dye added



One of the farms we were on had this at the end of the line so product was not making it through the system properly

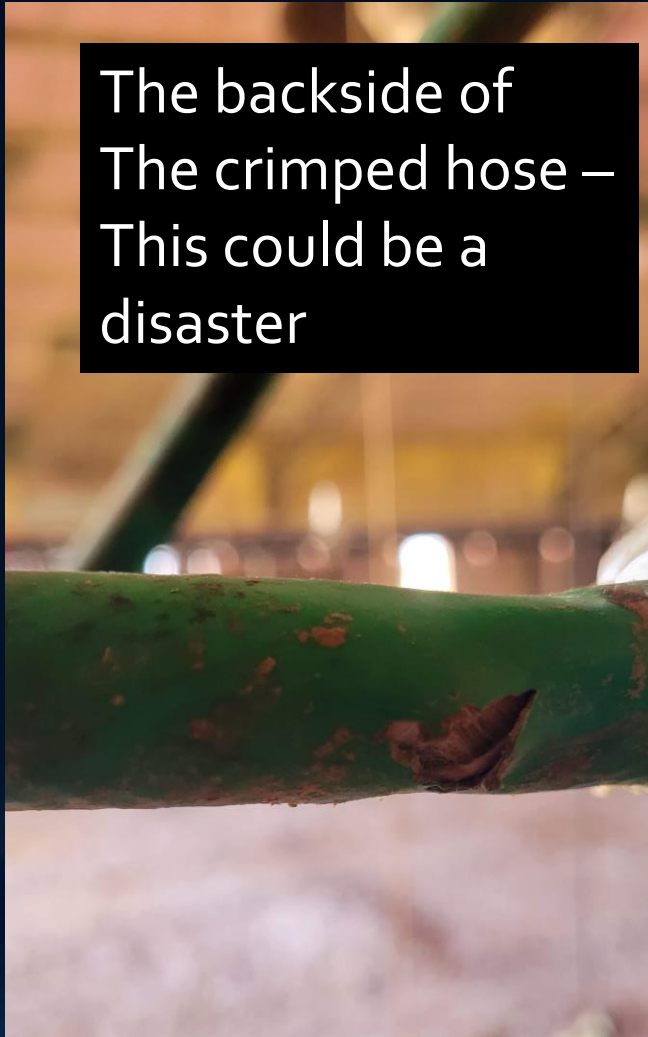


Don't go cheap on your flush hoses!

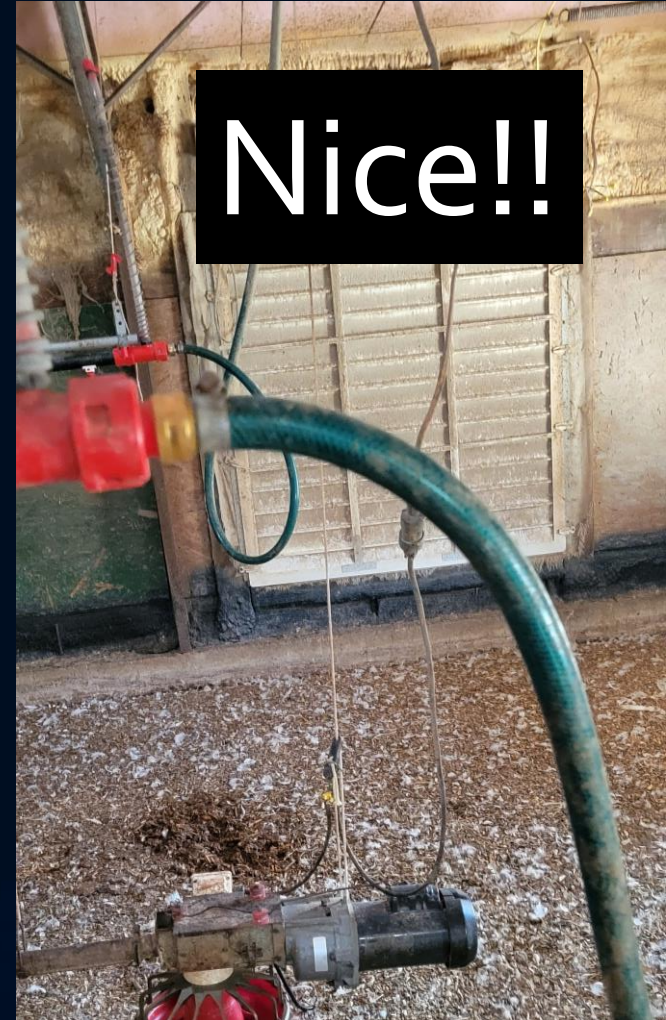
Nope!



The backside of
The crimped hose –
This could be a
disaster



Nice!!



The step most people skip that can make ALL the difference: triggering the drinkers



**Sometimes an expert
is needed.....**



**But sometimes you just need a little guidance on
how to make the system work
or a little digging on why it isn't working**





Questions?

Thank you!!

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