

# Water In An Antibiotic Free World: What Could I Be Missing?

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# What Does The Removal Of Antibiotics Have To Do With The Water?

- ▶ Pulling a tool (Antibiotics) from our tool box has created the sense of a void
- ▶ There has been a flood of products come on to the market to fill this void
- ▶ Growers are searching for supplements to enhance bird performance
- ▶ The easiest access point for most of these supplements is the water line



As A Result, We Are Seeing A  
Tremendous Increase In Water Line  
Issues



# Examples Of What We Are Seeing In The Field

- ▶ Group had an excellent water program as antibiotics were removed
- ▶ Decided to cut expenses and water treatment was one of the items to be cut
- ▶ Flock after flock began to drop in performance
- ▶ One year later, they finally turned back to water lines and found this:



# Examples of What We Are Seeing In The Field

- ▶ Group had pulled antibiotics and performance was poor
- ▶ Used vitamins and acid products to improve performance issues
- ▶ Knew they needed to clean lines
- ▶ Did not get cleaning product down into drinker heads (open pan)





# Examples of What We Are Seeing In The Field

- ▶ Began raising birds with no antibiotics
- ▶ Invested in expensive water treatment system
- ▶ Used multiple supplements
- ▶ Did not clean between flocks due to faith in expensive system



# It's The Hand We've Been Dealt

- ▶ In this new world, the absence of antibiotics has revealed underlying issues
- ▶ Many of these underlying issues were unknown or thought to be irrelevant
- ▶ Now is an opportunity to solve the root problems rather than treat the symptoms
- ▶ Our industry has had to adjust to raising birds in a Proactive Manner Instead Of A Reactive Manner



Historically we have treated the  
problem. Now we have to prevent  
the problem.



# Where Are We Finding These Root Problems?

- ▶ Litter
- ▶ Ventilation System
- ▶ Bio Security Failings
- ▶ Water



# With Water, We Often Don't Know Where To Start Or Why

- ▶ Why would the water be a problem? What is in it?
- ▶ I haven't had issues with my water in the past, why would that change?
- ▶ Where do I start?
- ▶ The overload of information and “magic pills” leaves us confused



# What Is In The Water?

1. **Minerals** – come from the water source and build up in the water line
2. **Living Organisms** – come from BOTH the water source AND the barn environment



# Bird Health And Minerals

Flushing can be caused by:

- ▶ Magnesium
- ▶ Sodium + chlorides

Decreased consumption can be caused by:

- ▶ Zinc (astringent taste)
- ▶ Iron (bitter taste)
- ▶ Copper (bitter taste)

Poor growth, weak bones, intestinal irritation can be caused correspondingly by:

- ▶ Nitrates
- ▶ Lead
- ▶ copper

Minerals that bacteria use as an energy source and may subsequently cause flushing:

- ▶ Sulfur
- ▶ Iron (e. coli, pseudomonas especially)

So now you not only have a mineral issue for your equipment, but you also have a bacterial issue for your birds



# Did We Use Medication To Fix These Problems In The Past?

Instead of medicating our way out of the problem, now we can:

- ▶ Do A Mineral Test
- ▶ Install/Increase Filtration – Sand filters, Carbon filters, larger cotton filters, Reverse Osmosis, media filters, etc.
- ▶ Descale Water Lines





# The Filters May Be Providing You With Information

Do You Need Additional Filtration?



What is your pump  
Pulling? Minerals?  
Sand? Silt? Clay?



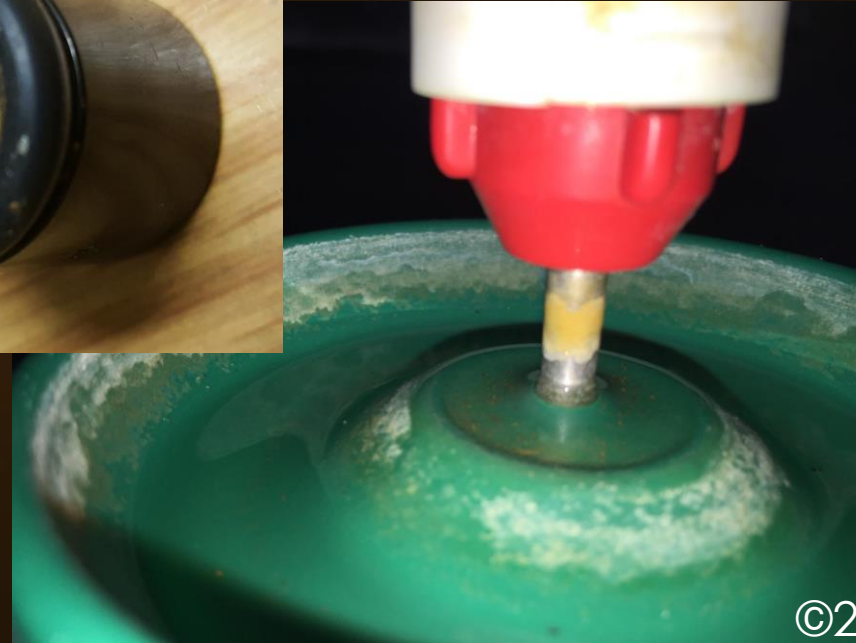
Are you Doing the  
Basics?





# If There Are Minerals, There Is Scale

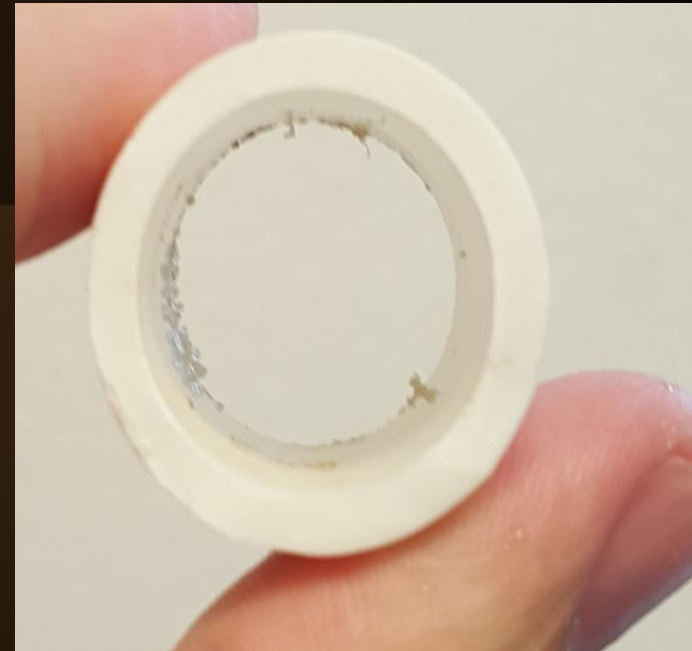
- ▶ Mineral Scale helps hide bacteria
- ▶ Damages our equipment
- ▶ Randomly flakes off inside of water line



# Remove Mineral Build-up From The Water Line: Descale

Once per year, use an acidic solution that will get the pH in the water line below 2. Allow it to sit for 24 hours

Now flush all lines thoroughly with fresh water  
and trigger the drinkers



Now We Move to the Second  
Potential Source of Issues:

Living Organisms and Organics in  
the Water Line



# We Were Medicating Our Way Out Of These Issues. Now What?

- ▶ High mortality
- ▶ Enteric issues
- ▶ Poor flock performance
- ▶ Disease flock after flock
- ▶ Low vaccination effect
- ▶ Low water consumption





# What Has Changed Is What We Are Putting In The Water And The Emphasis On Water

- ▶ With the removal of antibiotics, additive use has increased as the grower looks to solve health and management issues in other ways
- ▶ Many industry groups have also added “Water Maintenance Programs” to their Best Management Practices Guidelines



# Again, The Filters Can Be Providing Information

That slime on the filter is  
bacteria, yeast, mold,  
fungi or algae



Sometimes it's  
obvious



Sometimes it's not



# The Problem Can Work It's Way Backwards Through The System

Algae growth in the filter – this can start in the barns and grow backwards in the system



# Bacteria In The Water Line Can Come From Several Sources In The Barn

- ▶ Came in through ventilation
- ▶ Airborne from disturbed litter
- ▶ “Other” living creatures in the environment
- ▶ Deposited by birds themselves
- ▶ Left from previous flock





# “Left From Previous Flock”

All the build-up from the mature birds that left days ago are waiting for the chicks or pullets

In the first few days of a chicks life there is very little diversity in the cecum microbiome\*

By day 14 the cecum microbiome has gone from a mainly Gram negative group such as **Salmonella, Klebsiella, e. coli** to Gram positive organisms such as **Clostridium, Listeria, Staphylococcus**\*

The mature birds leave a very different build-up in the system than what they started with, thus challenging the chicks that are placed days or weeks later

\*Published in Frontiers in Veterinary Science, 2016. Anne L Ballou et al., Prestage Department of Poultry Science, NC State University





# Now The New Flock Is Challenged

Then We Provide:

- ▶ Warm, slow moving water
- ▶ Continuous re-inoculation
- ▶ Supplements for birds AND bacteria

The question becomes not “Why aren’t they thriving?”, but “Why would they thrive?”



# Water Consumption And Weight Gain

	0-7 days Grams/Bird	0-21 days Grams/Bird
(No Restriction)	187	869
10% Restriction	165	730
20% Restriction	155	641
30% Restriction	139	553



# Water Consumption And Feed Conversion

	0-21 days
No Restriction	1.31
10% Restriction	1.42
20% Restriction	1.44
30% Restriction	1.53

Source: Viola, T.H., 2003 – Cobb-Vantress



# What Can Cause A Restriction?

Are the drinkers sticky? Are they clogged?

Is there an organic build-up that may be allowing less water to flow?

Have minerals sealed some drinkers shut?

Is a mineral build-up changing the taste?

Are the minerals themselves affecting performance?

Now add other minor issues with heat, ventilation, litter, etc., and the performance never recovers.



# The First Few Weeks Can Make Or Break The Flock Performance

- ▶ Remember how slow the water is moving the first few weeks
- ▶ The water will be as warm as the barn, at least 90° F is common
- ▶ The chicks will continuously “inoculate” the same water over and over because it is moving so slowly
- ▶ According to Cobb/Vantress the chick could have a 100% weight gain in the first 72 hours

How Important Is The Water Quality To You At This Point?





# When The Bird Drinks Less Water You Get A Lighter Bird With A Higher Feed Conversion

In The past, this is where we would have  
considered medication or antibiotic  
feed supplementation



We Often “Feed” What Is In  
The Water Line – Remember  
The Previous Examples.....



# Supplements Are Not Just Helping Birds Grow.....

- \*Farm removed antibiotics
- \*Began to use alternative supplements
- \*Added 4 or 5 products through water line  
(Vitamins, Electrolytes, Acids, Etc.)
- \*Clogged drinkers
- \*Birds had no water
- \*Picked up 3 days early
- \*Had to take water lines apart to clean



# A Side Note About Acid Use:

- ▶ Acids – We use acids for all kinds of issues on the farm:
  - ▶ “Tighten the gut”
  - ▶ Lower pH in water
  - ▶ Entice feed/water intake at feed change
  - ▶ De-scale water lines

Long term use of acids with no water treatment program promotes the growth of acid loving algae, molds, fungus and yeasts.

**Follow acid use with water treatment.**





# All A Result Of Acid Use And No Water Treatment





# Sometimes We Do More Damage Than Good When We “Play” With Water Treatment

We come in with a little acid here,  
a weak chlorine there and we  
give the bacteria a chance to  
produce a protective slime layer

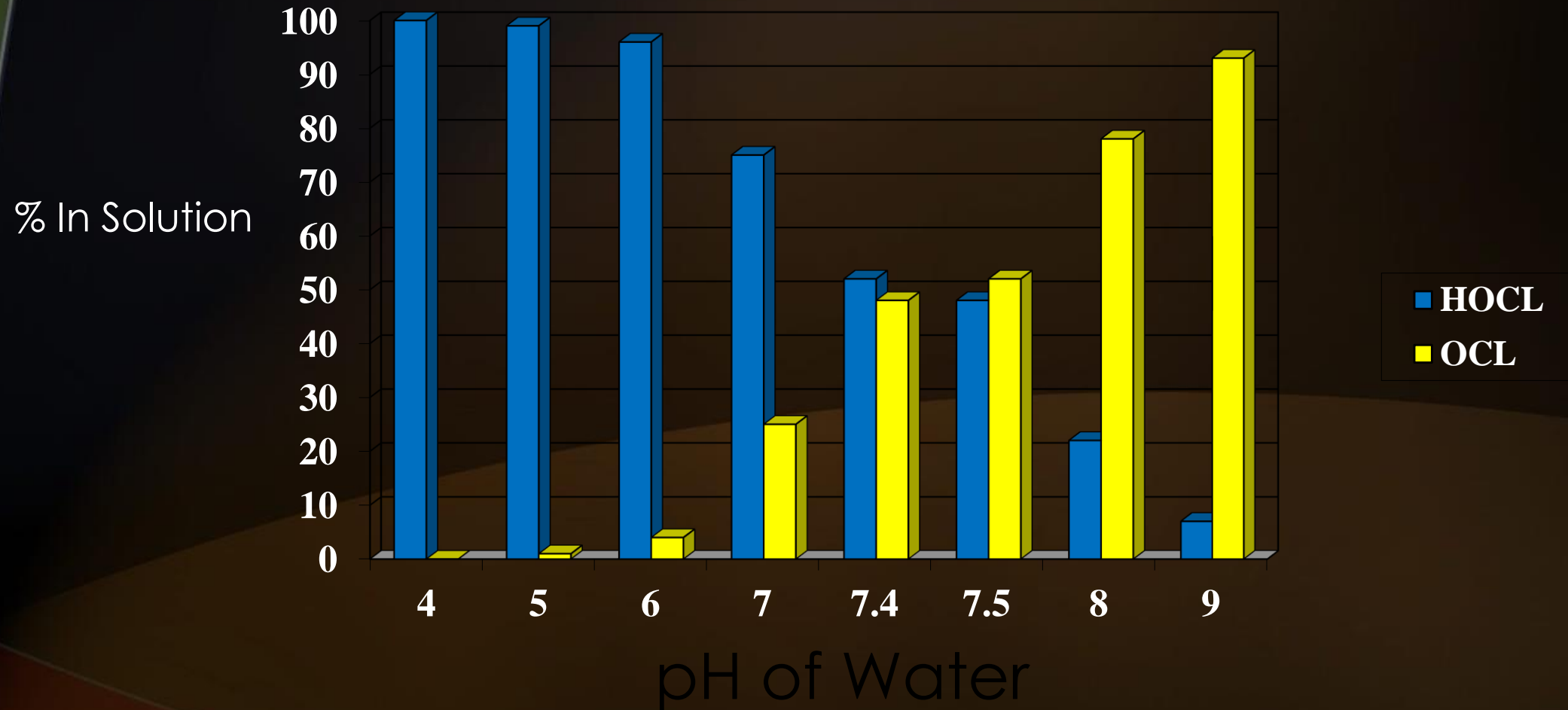


# Example Of Chlorine Resistant Bacteria

Use alternative products for 2 flocks if you find your chlorine is not doing as good a job as it used to



# How pH Affects Chlorine Ratio of Hypochlorous Acid to Chloric Ion



# Clean The Water Lines When The Barn Is Empty

When the barn is empty is the time to use a product that can clean the water lines – that can be a stronger solution of what you are using during the flock (make sure it is designed for that) or a product designed specifically for cleaning water lines



# Use Daily Water Treatment

- ▶ The first two weeks of a flock – warm, slow moving water that is continuously re-inoculated needs to be treated
- ▶ After you have added any supplements – this includes acids
- ▶ For 7 days after the injection of a vaccine through the water line





# In Conclusion:

- ▶ Test Water For Mineral Content
- ▶ Install Adequate Filtration
- ▶ Ask Yourself If Supplements Are Really Necessary
- ▶ Clean Water Lines When The Barn Is Empty
- ▶ Descale Water Lines Once Per Year (If not on municipal water)
- ▶ Treat The Water After The Use Of Supplements



Where Do You Want Your Bird to  
Use It's Energy?

Are You Allowing it to Perform at it's  
Most Efficient Level?

What the Bird Really Needs is Clean  
Water.

