Flock Performance Depends on a Safe Water Supply

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Jones County Community College - Ellisville, MS
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Why is Clean Water Important?

• Better start for your birds
  – Better feed conversion and growth rate
  – Less morbidity & mortality

• Better overall performance = increased pay!
  – Birds are different today than 5 years ago
  – Faster growth and higher yields
  – Perhaps a weaker immune system

• Part of “Best Management Practices”
  – Meet integrator guidelines and expectations
  – Public pressure (perception = reality to most folks)
What Is a Safe, Clean Water Supply?

- Slightly Acidic pH (6.2 to 6.8)
- Free of bacteria
- Few (or no) heavy metals
- Few dissolved solids
- Few suspended solids
- Sulfate levels??
- Nitrate levels??
Start with the Right Checklist of Information

- What is the water supply?
  - Municipal-how far and back flow preventers?
  - Well-depth and placement, any issues
  - Pond/Stream/Spring-location and design
  - Combination of the above

- Water test?
  - Minerals
  - Bacteria
  - Drip and swab samples
  - When was the last test?

- How old is the water system?
  - Drinkers-Regulators and standpipes
  - Plumbing
  - Distribution lines
    • Check flows-gallons per minute

- Has there been any changes or work to the water system?
  - Work on the well pump?
  - Damage to the wellhead?
  - Cut into any of the distribution pipes?

- Does the producer clean the system between flocks?
  - How?
  - With what?
  - The whole system?
    • House lines
    • Underground system

- What products does the producer use and what is the treatment schedule?
  - Sanitizers
  - Acids
  - Vitamins/Electrolytes
  - Vaccines
  - Other?
  - Any sanitizer monitoring and is there documentation?
What Influences Flock Performance?

- Housing/equipment
- Feed/water (availability, quality, and quantity)
- Stress level
- Air quality
- Litter quality
- Temperature
- Lighting program
- Sanitation (rodent control, biosecurity, etc.)
Water Supplies Change and are Affected by:

- Climate
- Well depth and location
- Seasonal variations (winter vs. summer)
- Agriculture, local industry, septic systems
- Geology
- Contaminants
- Surface water supplies are most at risk
What’s in Your Water?

• If you don’t know, find out with a water sample

• Minerals?? – can have a big effect on quality

• Algae and fungi?? – build-up can restrict flow

• Bacteria?? – can make the flock sick

• pH?? – too high or too low can be equally bad
24 minerals and pH for $20
Bird Health and Minerals

- Nitrates indicate fecal contamination; cause poor growth rate, poor feed conversion

- Sulfates, Mg, high Na/Cl can cause flushing, wet litter, high NH₃, disease challenge, & paw quality issues

- Algae, bacteria, & fungi thrive off of certain minerals

- Equipment may be damaged or may see poor performance in presence of certain minerals
  - Iron promotes E. coli and pseudomonas growth
  - Cl and Na can cause flushing (too much salt)
  - Ca and Mg can cause scaling; makes regulators and nipples malfunction
Biofilm: What is it?

**Biofilm:**
A complex structure adhering to surfaces that are regularly in contact with water, consisting of colonies of bacteria and usually other microorganisms such as yeasts, fungi, and protozoa that secrete a mucilaginous protective coating in which they are encased. Biofilms can form on solid or liquid surfaces as well as on soft tissue in living organisms, and are typically resistant to conventional methods of disinfection. Dental plaque, the slimy coating that fouls pipes and tanks, and algal mats on bodies of water are examples of biofilms.

Issues with Biofilms

- Develop rapidly in slow-flowing water systems where nutrients are available (nipple drinkers)
- Live on very little nutrients
- Can cause disease challenges; such as E. coli and bordetella
- Difficult to remove once in place
- Reduce effectiveness of disinfectants
- Breeding ground where microorganisms multiply
- Protects “bad bugs” from antibacterial agents
Management Practices may Promote Biofilm Growth

- Kool-Aid, Gatorade, Jell-O
- Vaccine and stabilizers
- Vitamins and electrolytes
- Antibiotics

- Are lines cleaned after any product use?
- Are lines sanitized during downtime?
- Is there a continuous water treatment program in place (chlorination, pH adjustment, etc.)?
Water Treatment and Cleaning Issues

• Where does water come from?
  – Well
  – Rural or community
  – Surface (pond or lake)

• What do you add?

• What is the mineral content? Bacterial load?

• Are there flock health or performance issues?
Water Sanitation

• Many growers have no sanitation program

• Those that do often use chlorine bleach
  – Most common sanitizer
  – Easily obtained and injected
  – Readily used when it enters water system
  – Presence of biofilm or organic material will challenge its effectiveness
Water Sanitation with Chlorine

- Inadequate concentration is a serious problem
  – Need 3-5 ppm free chlorine at end of line
- Type and growth stage of bacteria present may reduce effectiveness
- Water temperature below 65°F will decrease chlorine’s effectiveness
- Exposure time must be long enough
- Chlorination does not equal sanitation!!
Alternatives to Chlorine Bleach

- Stabilized, concentrated hydrogen peroxide products are good oxidizers and work well
  - Proxy-Clean, Siloxycide, HydroLine and others
  - Chlorine dioxide is also an alternative
- Stabilizer prevents $H_2O_2$ from converting to water and oxygen too soon
- Can be diluted and used in the water lines with birds in the house (2-4 oz. per gal of water and dose at 1:128)
- Works well on biofilms; safe for drinking water
Water Line Cleaning

- De-scale lines with acid if water supply contains minerals:
  - Calcium or magnesium (>80 ppm)
  - Iron or manganese (>0.5 ppm)
  - Sulfur (>80 ppm)
  - pH must be 5 or less to dissolve scale
  - Leave in lines 24 hours
- Flush acid from lines
- Follow acid with sanitizer
  - 4-6 oz. bleach/gallon stock solution (1 oz. stock/gal water)
  - Proxy Clean/Siloxycide stock solution - 2-4 ounces/gallon then pump into system with medicator at a rate of one ounce per gallon water (1:128)
  - This last step can help keep biofilm from returning
  - May even prevent drinkers from “sticking” after cleaning
Water Line Cleaning

- Use a Quick-Mix or EZ Mix proportioner pump to inject product directly into water
- Monitor flush hoses and watch for fizzing or dye
- Close the valve
- Trigger all the nipples and allow product to sit 24 to 72 hours
- Flush all the lines with fresh water
- Trigger all the nipples again and you’re done
Alternative Cleaning Method

- 3% solution in plastic trash barrel

- Drop a sump pump into the barrel and attach to the water system on the outgoing side of medicator (bypass medicator)

- Pump the solution through the water system

- Close valve, trigger nipples, let sit 24-72 hrs, flush with fresh water, trigger nipples

- Don’t mix acid & bleach (bad things happen)!!
Don’t Overlook a pH Challenge

- Farm with well water and a natural pH of 3.5
- Had not performed well for several flocks
- Poor weight and poor feed conversion issues
- Adjusted pH with baking soda in the water
- Added ½ pound to average weight of next flock

- Start with ½ cup baking soda/5 gals water
- Get test strips to monitor pH level; shoot for 6.2 to 6.8 pH range
Summary

• Of all the factors affecting flock performance, water is the least understood but possibly the most important

• Know what’s in your water
  – Mineral content
  – Biofilm/bacteria load may require extra cleaning
  – Don’t forget pH

• Optimize your water line cleaning/sanitation program
  – Strong cleaning between flocks will be beneficial
  – Acidifiers alone likely not enough (oxidizers, sanitizers)

• Once system is clean, take steps to keep it clean
  – Daily treatment program may be necessary
Thank You!!

Questions??