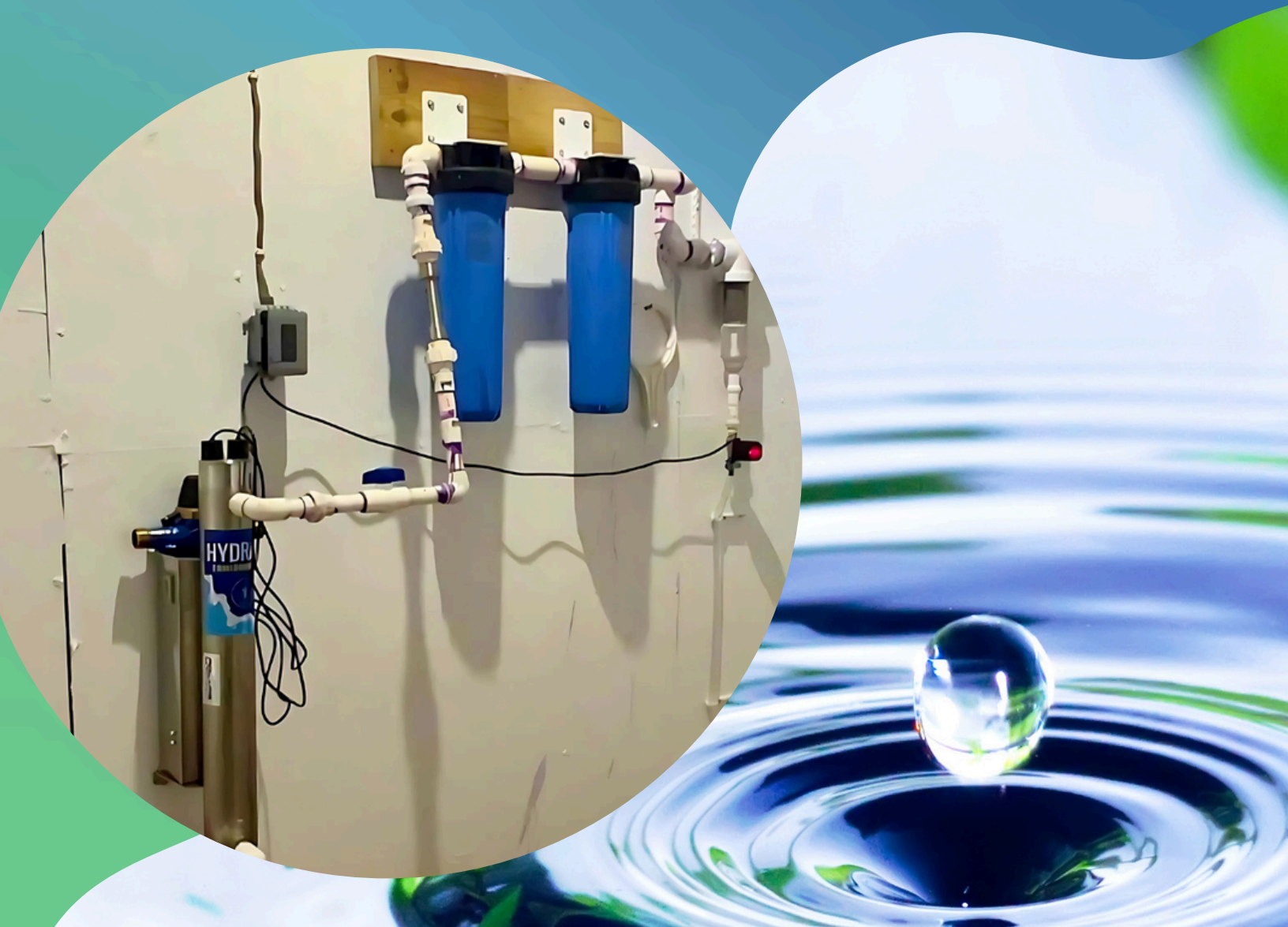




TOMIGUNN
ULTRA PERFORMANCE

HYDRA

Water Filtration and Disinfection System



Executive Summary

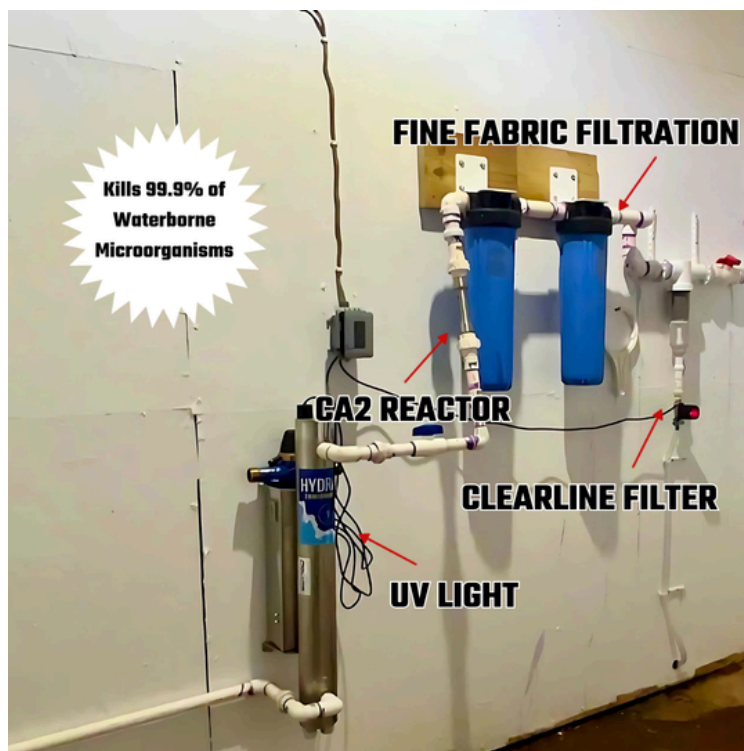
Water is the most consumed nutrient in poultry production, yet often the most overlooked. Poor water quality – well water laden with iron, heavy metals, calcium scale, and bacteria; city water often high in chlorides, fluoride, and other metals – silently harms flock health by disrupting gut flora, impairing enzyme and immune function, and worsening feed conversion while shortening equipment life.

Even low levels of chlorine or chlorine dioxide (0.5–5 ppm) rapidly inactivate live vaccines, antibiotics, vitamins, nutrients, and probiotics delivered through drinking water,¹ while high minerals or residual disinfectants damage beneficial microbes and shift gut pH, drastically reducing their effectiveness.

The poultry industry has long relied on chlorine dioxide and other chemical disinfectants for biosecurity, despite challenges like variable efficacy.²

The HYDRA water filtration system by TOMIGUNN eliminates that compromise. Using a proven combination of mechanical pre-filtration, mineral transformation (CA2 REACTOR), and high-intensity UV disinfection, HYDRA delivers pathogen-free, scale-free, residue-free water without a single chemical – preserving vaccine viability and probiotic performance while delivering clean water birds willingly drink.

The result is healthier birds, increased water consumption, lower operating costs, longer equipment life, and a rapid return on investment, typically 6–9 months when compared to chlorine dioxide systems.



From left: UV chamber (99.9% pathogen kill), CA2 REACTOR (prevents scaling with non-stick aragonite), twin 5-micron filters, and auto-purging CLEARLINE to remove large particulates. The total footprint is under four feet.



Iron in water is particularly troublesome because pathogenic bacteria like E. Coli thrive on iron deposits in pipes (left). Only mechanical filtration (right multi-stage system) reliably extracts it.

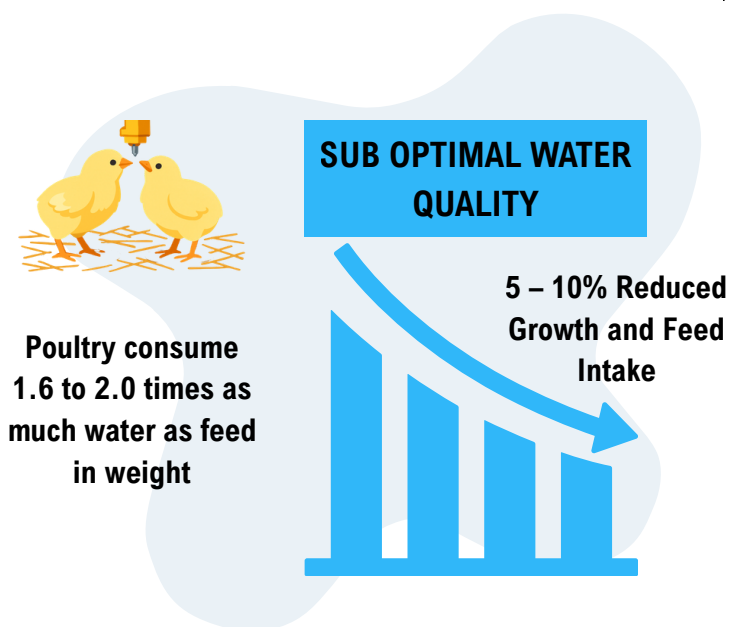
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Why Water Quality Is the Next Profit Center

Poultry consume approximately 1.6 to 2.0 times as much water as feed on a weight basis³

Suboptimal water quality (e.g., high total dissolved solids (TDS) >500 ppm) can reduce growth rate and feed intake by up to 5–10% and contribute to preventable performance losses⁴

Chemical disinfectants, while effective against some pathogens, create corrosive by-products, alter taste, and leave residues that stress poultry and complicate regulatory compliance⁴



Chlorine Dioxide Systems v. HYDRA

Metric	Chlorine Dioxide / Chemicals	HYDRA Chemical Residual-Free System
Equipment and Installation Base Cost	\$5,000–\$15,000 per farm (avg \$10,000) ⁵	\$4,500–\$11,000 per farm (median \$6,000) ⁶
Ongoing Chemical Cost	\$4,000–\$12,000 / farm / year ⁷	\$0
Corrosion & Scaling	Low to moderate (shortens line life ~1.5–2×) ⁸	Virtually eliminated
Pathogen Control	Good, but leaves chemical residues	99.9% UV kill, no residues ⁹
Bird Water Intake	Often reduced due to taste/odor	10–18% increase (clean, natural taste) ¹⁰
Regulatory Risk	Rising scrutiny on byproducts ¹¹	None
Typical ROI	N/A (ongoing expense)	6–9 months ¹²

The HYDRA System: Technology and Design

Every HYDRA system is custom-tailored after a straightforward water analysis. Flow rates range from 24 GPM (single house) to 900 GPM (multi-complex). Maintenance is minimal: UV bulbs changed every 9,000 hours (~1.5 years) and filter media every 6–12 months.

Stage	Component	Primary Function	Key Benefit to Poultry Operations
Large Particulates	2" CLEARLINE auto-purge spin-down	Removes large visible particulate	Prevents nipple clogs and cool-cell blockage
Iron & Sulfur Filtration With Auto Purge	Dedicated iron filter (optional)	Prevents iron build up corrosion and bacteria growth	Reduces biofilm and black slime in lines
50 microns	Pleated filter	Removes 99.9% of particulate greater than 50 microns	Phase 1 or filtration optimization removes most fine particulate
5-micron filtration pleated filter		Removes 99.9% of particulate greater than 5 microns	Removes fine particulate even many bacteria and most parasites
Mineral Optimization	CA2 REACTOR (stainless steel)	Converts calcium carbonate → bioavailable aragonite	Stops scaling; improves bone and eggshell quality
Disinfection	High-output UV (99.9% kill rate)	Destroys bacteria, viruses, protozoa without chemicals	Clean water that birds drink more of

Aragonite-Powered Calcium Optimization

Each HYDRA unit includes a CA2 REACTOR that converts conventional calcium carbonate into aragonite – a needle-like crystal form significantly less adherent than calcite, greatly reducing scale on pipes, nipples, and cool cells.¹³ This process eliminates calcium buildup on UV sleeves, ensuring consistent performance over the elements' life. It occurs at flow rates of 0.5–900 GPM depending on model size, with near-complete conversion efficiency for available calcium, ensuring scale-free delivery while maintaining natural pH and taste.

Feeding trials demonstrate aragonite offers 179% relative bioavailability compared to limestone (measured via tibia ash), enhancing feed efficiency and bone mineralization in laying hens by improving calcium uptake.¹⁴ For cooling systems, aragonite's non-adherent crystals prevent hard scale buildup on cool cells, pipes, and nipples, unlike calcite, reducing maintenance and improving evaporative efficiency.¹⁵



Cross-Section View CA2 REACTOR

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CA2 REACTOR Applications

Cool Cell Makeup Water

- Incoming water is conditioned prior to entering float valve.
- Select REACTOR based on avg water flow during peak demands
- Aragonite solution (static): 21 days
- Drain existing water from sump before startup

CA2 REACTOR SPECIFICATIONS		
Model	ZAF010	ZAF010H
Max Flow	9 GPM	17 GPM
Max Loss	2.3 psi	2.5
Connection	1" NPTM	1" NPTM
Length (in)	7.3	8.3
Diameter (in)	1.7	1.9

Booster Station System

- Water from cisterns is conditioned at the outlet of each pump
- Sizing based on nominal, single pump flow
- Efficiency maintained during single and multi-pump operation

CA2 REACTOR SPECIFICATIONS	
Model	ZAF014
Max Flow	31 GPM
Max Loss	2.6 psi
Connection	1-1/4" NPTM
Length (in)	21.6
Diameter (in)	1.3

In a typical U.S. broiler house (50,000 birds, 100–200 ppm source-water calcium), the CA2 REACTOR supplies each bird approximately 0.18–0.36 grams of aragonite daily through treated water, based on 2 gallons/bird consumption and 99% conversion efficiency.¹⁶

Case Studies: HYDRA Installations

Large Turkey Grower – Minnesota (2024)

Problem: Clay, sand, rust, heavy metals, and severe calcium scaling from aging wells

Solution: Two permanent 24 GPM HYDRA systems with full CLEARLINE + CA2 REACTOR + UV

Results: Zero scaling on cool cells, dramatically clearer water, improved gut health when paired with probiotics, and virtually no maintenance calls in the first year



Broiler Grower – West Virginia (2025)

Problem: Variable well water quality causing inconsistent performance

Solution: Single 24 GPM HYDRA with auto-purge and UV

Results: Consistent pathogen-free water, reduced line flushing, and grower reports “By using TOMIGUNN probiotics and HYDRA, I went from facing the possibility of going out of business to leading the tournament rounds”



Broiler Operation on City Water – Illinois (2025)

Problem: Positive coliform tests despite municipal treatment

Solution: Compact HYDRA unit with 5-micron + UV

Results: Post-install bacteria tests showed zero coliforms; grower comment: “Consistently clear water free of microorganisms, exactly what we needed”



High-Density Broiler Complex – Mississippi U.S. (2024)

Problem: High coliform counts requiring frequent shocking; heavy scaling on cool cells; dissatisfaction with expense and corrosion from chlorine dioxide system

Solution: Full wellhead HYDRA suite (2" CLEARLINE → fine filtration → CA2 REACTOR → UV)

Results: 99.9% microbial destruction, scale-free cool cells, extended equipment life, and elimination of chemical purchases



References

1. Hudson et al., 2025 – <https://www.srpublication.com/drinking-water-vaccination-in-chicken/> (Residual chlorine inactivates live vaccines, reducing potency and bird protection) Aviagen, 2008 https://aviagen.com/assets/Tech_Center/Broiler_Breeder_Tech_Articles/English/AviagenBrief_DrinkingWater_Vaccination_Sept08.pdf (Chlorine in water kills or renders live vaccines ineffective by direct oxidation; high hard metals exacerbate this); Poultry World Article, 2013 – <https://www.poultryworld.net/health-nutrition/how-effective-is-your-drinking-water-vaccination/> (Chlorinated water dilutes and deactivates vaccines during delivery, lowering uniformity and efficacy; neutralization essential for success)
2. Watkins, 2020 – <https://westernpoultryconference.ca/wp-content/uploads/2020/03/8.-Got-Water-S-Watkins.pdf>
3. UGA Extension, 2005 – <https://fieldreport.caes.uga.edu/publications/B1301/poultry-drinking-water-primer/>
4. Tabler, 2019 – <https://extension.msstate.edu/publications/water-quality-critical-broiler-performance>
5. Averages are estimates based on PureLine/Ecolab, 2024 – <https://www.pureline.com/calculator/>
6. Averages are estimates based on TOMIGUNN installs, 2024 & 2025 – <https://tomigunn.com/hydra/>
7. PureLine/Ecolab, 2024; Feedwater Ltd., 2025; St David's Poultry Team, 2020 – supra notes 5 & 6
8. ALVIM CleanTech, 2023; Feedwater Ltd., 2025 – supra note 5
9. UGA Extension, 2005 – supra note 3 (UV systems meeting NSF/ANSI 55 Class A deliver ≥ 40 mJ/cm² and achieve 99.9 % inactivation of bacteria, viruses, and protozoa without chemical residues (UGA Extension B1301, 2023).
10. Damaziak et al., 2016 – <https://www.scielo.br/j/abmvz/a/WfphwBjf6LmYykRpNFLZTfD/?lang=en>
11. Afolabi et al., 2024 – <https://scialert.net/fulltext/?doi=ijps.2024.66.71>
12. EFSA Panel on Contaminants in the Food Chain (CONTAM), 2015 – <https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2015.4135> (Scientific opinion on chlorate in food; led to EU default MRL of 0.01 mg/kg and increasing global scrutiny of chlorine dioxide byproducts in poultry processing and drinking water)
13. PureLine ROI tool, 2024 & TOMIGUNN installs 2024 & 2025 – supra notes 5 & 6. Typical ROI calculated using HYDRA median installation cost of \$6,000 versus average chlorine dioxide system installation of \$10,000 plus average annual chemical cost of \$8,000 (\$4,000–\$12,000 range). Total first-year cost for chlorine dioxide: ~\$18,000. HYDRA payback period: 6–9 months at average annual savings of \$8,000.
14. Martínez Moya and Boluda Botella, 2021 – <https://www.mdpi.com/2073-4441/13/17/2365>
15. Lyons et al., 2024 – https://en.engormix.com/poultry-industry/minerals-poultry-nutrition/evaluation-aragonite-calcium-source_a53879/
16. Martínez Moya and Boluda Botella, 2021 – supra note 13
17. The estimate was derived by multiplying average broiler water consumption (1.8–2.0 gallons per bird per day, per Aviagen Ross Broiler Handbook 2023, p. 46; Cobb Broiler Guide 2024, p. 28) by typical U.S. well-water calcium levels (100–200 ppm) and applying CA2 REACTOR's near-100% conversion efficiency to yield 0.18–0.36 grams of aragonite per bird, with variations based on source hardness and flow rate - https://aviagen.com/assets/Tech_Center/Ross_Broiler/Aviagen-ROSS-Broiler-Handbook-EN.pdf; <https://www.cobbgenetics.com/resource/47>

Run With the Gunn

TOMIGUNN provides microbial probiotics, litter amendments, biosecurity products, water filtration, vapor dry-steam cleaners, air scrubbers, and soil enhancers for poultry and livestock operations. Every HYDRA system is backed by a 100% satisfaction guarantee and decades of building expertise.

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