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Hatchery Sanitation: Questions, Answers, and Solutions to Common Pinch Points

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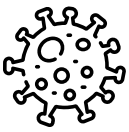
EXECUTIVE SUMMARY



The global COVID-19 pandemic — while "over" from an emerging disease outbreak perspective — has impacted the poultry market tremendously. Respiratory enveloped viruses impacting birds and/or humans appear to be a long-term challenge. Additionally, the hatchery labor shortage that existed prior to 2020 has grown significantly since the cofactors of the COVID-19 pandemic and the U.S. poultry hatchery industry going (essentially 100%) antibiotic-free.

Significant bacterial and fungal pathogen challenges to hatcheries in the form of livability and performance such as uniformity and sub-chronic immune suppression are on the rise. These challenges began after the loss of imazalil (Clinafarm) as a fungicide in 2022 — following the losses of *in ovo* and most feed-grade routine antibiotics, coupled with the loss of tributylin-tin oxide (BioSentry 904 Disinfectant), a key disinfectant reformulated around 2016.

Best Management Practices (BMP) documentation is essential for hatchery managers. A new hatchery manager may have "inherited" a written program from a former hatchery manager, or a seasoned hatchery manager may have everything under control and see no need for a written BMP for Hatchery Sanitation."

Has the aging hatchery infrastructure in the U.S. and labor availability been able to adapt and improve to meet new pathogen challenge even with the losses of tools that were leaned upon so heavily in the past?

Given current industry challenges, it's time to take a fresh look at re-invigorating sanitation and biosecurity through the lens of simplicity and the ability to monitor and train hatchery staff in a simple, cost-effective manner.

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About Poultry Hatchery Disinfection

Physical cleaning may be the greatest success measurement for sanitation best practices. After all, clean can be observed; it doesn't need a test strip or color change kit. One can see whether something is clean by the way it looks and smells. An employee should spend 4/5 of their time (80%) simply cleaning (Figure 1a).

Pre-cleaning (shoveling chick down into a trash can before cleaning hatch cabinets, for example), foaming the soap (or spraying a gel soap), washing/scrubbing, and then rinsing down the drain are all cleaning steps that must be completed prior to disinfecting. Some disinfectants can tolerate small amounts of organic debris, but cleaning first is critical to getting the best results out of the final disinfecting process.

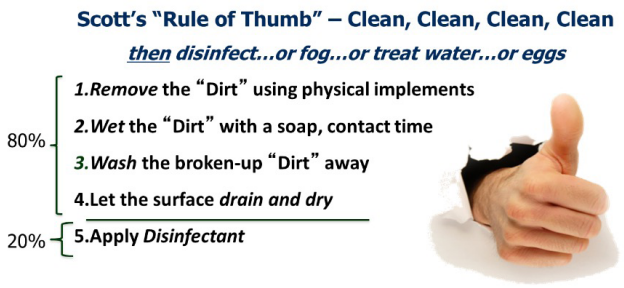

Figure 1a. Scott's Rule of Thumb: Cleaning in a hatchery should occupy 80% of both effort and measurement, with less empahsis on the disinfectant step, which is set up for success when simple cleaning is conducted first.

Figure 1b (right). Hatchery cleaning tools should be cleaned and hung up to dry daily, organized and labeled to ensure that nothing is missing to complete each day's sanitation tasks. Cleaning with dirty tools shoved in a corner sends the wrong message about the value of sanitation to any hatchery staff.

Cleaning vs. Disinfection

In hatcheries, cleaning should be a priority along with disinfecting. Cleaning might seem simple, but it must be empowered with simple cleaning tools that are also kept clean and organized in an area that is well lit, easily available, and presents sanitation as an important task to hatch metrics.

Foamers for both alkaline and acidic cleaners and disinfectants should be securely bilingually labeled with laminated product title and use concentrations, and stored nightly in a protected and organized area.

Cleaning instruction begins with a well-defined sanitation best management practices (BMP) document that is unique to each hatchery. The cleaning process document shall outline each item and area/room process in an easily understandable way that is supported throughout all levels of live production. Without a written plan, it is hard to measure and enforce against process failures.

Effective, Written Hatchery Sanitation Processes

It's hard to know what changes are needed to a hatchery sanitation process without a clear map of how to maintain and improve processes already in place. Sanitation is and should be very, very routine, and documentation of procedures is a fantastic complement to establish solid sanitation routines.

Sanitation procedures should be as simple and easy to understand as the processes used to prepare daily vaccines. For example, sanitation routines with easy validation steps such as using test strips, a (black-light) flashlight, and a "white glove test" help employees to improve hatch sanitation through validation of proper procedures.

Best Management Practices (BMP) documentation is essential for hatchery managers. A new hatchery manager may have "inherited" a written program from a former hatchery manager, or a seasoned hatchery manager may have everything under control and see no need for a written BMP for Hatchery Sanitation. But ***a documented program*** makes it easier to set expectations and then enforce daily sanitation compliance. Without proper documentation, it can lead to unreliable attainment of hatch metrics that are impacted by

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cleaning and disinfection. Any hatchery manager can ask their disinfectant and sanitizer distributors or Arxada Technical Services for a template hatchery sanitation BMP, or they can create one themselves if they don't have one.

The Disinfectant Dip Tank

Approximately 85% of the U.S. poultry hatchery market has migrated from spray bars to dip tanks in the last ten years, due primarily to lower monthly chemical usage. Dip tanks result in a complete immersion of each tray and/or box into and under the disinfectant. The commonly observed concentration of the disinfectant is almost always between zero ppm to well below failure concentration. This technology is potentially more effective than spray bars, but there are ways to help ensure further successes when using dip tanks.

Dip tanks should have a ***metering pump on a timer***, providing fresh disinfectant throughout the processing day. No need for medicator pumps or float valves, as these do not provide enough disinfectant throughout a hatch day to the increasingly dirty water in a constant volume dip tank, with disinfectant being removed by the surface of each hatch tray or chick box (by design).

Between inactivation by organic material in the dip tank (from the tray/box washer), constant further dilution by water coming from the wet trays, and removal of disinfectant chemistry on each tray, ***twice-filling-per-shift (start-up and break) medicator pumps is ineffective***. In addition, float valves are similarly ineffective, as the water level on the dip tank should not change much — if at all — during processing.

The remedy? Ensure good contact time using the correct disinfectant concentration with several seconds of immersion into a stainless-steel tank containing disinfectant administered through a timer pump.

The Tray Wash Room

The ideal temperature for tray wash water is 140-150 degrees Fahrenheit, with 140 degrees being the most common maximum number. That's because tray wash soaps work best in warm temperatures, and 140 degrees is the warmest needed for most soaps to work.

Aging hatchery infrastructure in the U.S. has created a constant challenge to provide cleaner trays and boxes with outdated or inadequate capacity boilers in an antibiotic-free (ABF) poultry business. That's why hatchery managers and maintenance superintendents began closing or blocking steam baffles — to "keep heat in the tray wash" — which translates to a very hot, steamy wet tray wash room. This can create numerous secondary pathogen issues.

Based on commonly observed industry history, it is clear that letting steam from the tray wash room permeate throughout the hatchery increases bacteria and mold challenges. Propped open doors in the summer and even winter (to keep cool) and the closure of steam vents leading to the roof have created a pathogen "sauna" environment in many hatcheries.

Figure 2a (left). Stainless steel disinfectant dip tank with a stacking belt assistant separating the employee from the warm temp and overspray.

Figure 2b (right). Test strip showing zero ppm disinfectant (no color change from yellow to green) only 25 minutes into processing after fresh 850 ppm disinfectant solution was added through a medicator pump after the morning break.

Rather than becoming fixated on stopgap methods to keep 140-degree temps and enforcing those temps in the tray wash, live managers should instead use the mortality numbers penalized by creating a wet hatchery (*Aspergilus* challenges, *Pseudomonas*, coliforms, etc.) to gain infrastructure improvement via added boiler capacity.

The Simplest Test for Sanitation Efficacy

There are three questions that every hatchery manager must be able to quickly answer regarding sanitation. These questions provide key indicators of whether there is significant understanding and engagement between hatchery managers, maintenance managers, and the site's own written cleaning and disinfection program.

If a veterinarian or live manager wants to assess the sanitation status of a hatchery, one could walk into the hatchery and ask the manager:

1) What is the ppm disinfectant in your tray wash disinfectant device, whether it's a dip tank or a spray bar?
Can you show the ppm levels on boxes and trays outside of the spray stream and not inside the dip tank?

2) What are your processes and equipment for cleaning the hatcher cabinets after pull?
What is the correct foam quality and how much soap is used for each cleaning day?

How long does the surface sit and where are the clean tools you are using to do the job?

What is the ppm of the disinfectant levels in the foamer and/or fogger?

3) What is the detailed process you use to manage clean air, eggs, and water?
How are you maintaining and managing pathogen levels on those three materials?

Everyone in the hatchery — especially hatchery managers — must care about and have a stake in effective sanitation, with clarity and organization being the most important factors for maintaining a clean hatchery. Best practices can easily be summarized in five steps: understand your current sanitation and disinfection processes; plan for maintaining or improving these processes; put the plan on paper; put it into action... and then validate those procedures with sanitation employees.

A solid sanitation program starts with knowing where you are and where you need to be to ensure product safety and efficacy. But it also starts with documentation. Having a ***written plan*** — and tracing your sanitation processes back to that plan — might be a redeeming feature in case of a mortality uptick.

Sanitation may not be sexy; it's not as technical as vaccines or other aspects of avian care. But hatchery managers need to acknowledge its importance. Failing dip tanks, empty drums, too-hot tray wash rooms, and lack of written sanitation procedures can all be fixed. But a sharp focus on the process of proper hatchery sanitation as a key priority begins with education followed by daily execution and a validation drive to ***"inspect what you expect".***

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