Optimization of Environmental Monitoring Solutions in Poultry Hatcheries for Sustainable Practices

The Aviagen Group is the global leader in poultry genetics, and also the undisputed technology leader in R&D, as well as a pioneer in innovative hygiene and animal welfare concepts. This combination is not a coincidence, but the result of a philosophy that is embraced by all employees in every step of the work process.

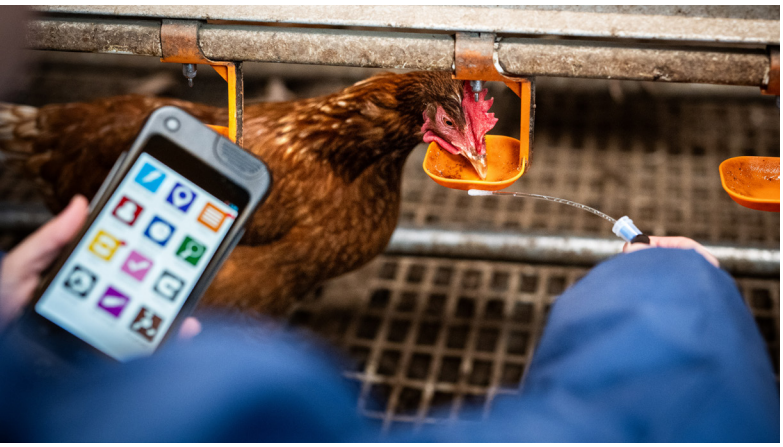
To help maintain their breeding stocks, Aviagen maintains the strictest of health and biosecurity measures, including science-based methodologies to minimize or prevent microbial contamination or illnesses in their stock. Even though specialized poultry veterinarians and microbiologists supervise the sites, with 500 broiler farms and 11 hatcheries, this is no easy task. As a result, Aviagen had been searching for a way to align all global facilities with common methodologies using innovative software and ATP testing solutions to capture cleanliness within their facilities. By incorporating these goals across all sites, they felt they could achieve rapid, consistent, quantitative results and be able to compare data between facilities to improve processes, cost savings and standard operating procedures for hygiene and animal welfare.

In order to adhere to the standards of the National Poultry Improvement Plan (NPIP) in the US, and the National Control Plans set in place by the European Committee as well as Antimicrobial Susceptability Testing (EUCAST), Aviagen needs to maintain on-farm sanitation standards across all sites, globally. While performing sanitation checks in their hatcheries using both conventional plating and a non-Hygiena ATP test in the US and UK, respectfully, the Aviagen team wanted to extract more information from their data. Their goal was to transition from conventional testing methods to a rapid solution that had a cloud-based data housing system; one which could provide them with globally-accessible, up-to-date data visualization features (see Figure 1) to make real-time data-driven decisions from their data.

With their implemented baselines, Aviagen was able to efficiently identify sample locations that passed, failed or showed caution levels based on the amount of ATP available on the surfaces. For any locations that had fail or caution ATP levels, Aviagen tightened their internal SOPs to ensure maximum cleanliness was achieved throughout their facilities. With the previously used ATP technology, they felt as if it was “outdated” and needed a solution that could move them away from using a paper-based reporting system. While the company embraced new ideas and technology, convincing all stakeholders about the efficacy of these new methods posed a significant challenge.

A cleaning verification system with rapid results was of key importance to Aviagen, in contrast to plating. “A prompt and efficient delivery of results from a cleaning verification system is crucial for our operation and this method outshines traditional plating methods,” emphasized Steven Campas, Senior Microbiologist at Aviagen located in Alabama. However, with two separate sectors, aligning common goals through a rapid ATP solution and software demanded considerable effort. Quality Assurance and live production testing staff were major stakeholders to bring on board for conversions. They needed a solution that would address the regional differences existing in their hygiene monitoring processes.

Even though they had previously used a competitor ATP testing system in the past, they saw the potential of Hygiena's fully integrated environmental monitoring ecosystem that captures a variety of hygiene quality test results, like ATP and microorganism data, and visualize those results in a way that makes identifying actionable insights easy. Therefore, they initiated an assessment of the system, trying a blanket rollout strategy, and integrating ATP testing into their current hygiene monitoring processes. Aviagen saw the advantages that SureTrend® software offers when utilized across sites, paired with Hygiena's testing devices and instruments. The software enabled Aviagen to make data-driven decisions in real time. This allowed them to take immediate corrective actions to mitigate any potential contamination risks; furthermore, with advanced environmental monitoring capabilities that streamlined hatchery operations, they identified improved efficiency and easy data management. (A highlight of their initial data is shown in Appendix 1).



According to Dr. Kara Friel, a Laboratory Manager at Aviagen UK Ltd., Scotland, "Moving to the Hygiena® EnSURE® Touch system has meant we can be more sustainable, as we no longer need to record results on paper. This has also given better traceability for results as they are uploaded in real time to the SureTrend software. All results for all sites are stored in one database (SureTrend) which allows the results to be easily accessed to send reports as well as for trending." She added, "In addition, any changes to site sampling points can be made in the centralized database and then transferred to all handsets."

As a result of this assessment, Aviagen realized that Hygiena's cutting-edge solutions empowered them to reduce time and effort to decision, given them more time to focus on other parts of their business, in the pursuit of superior innovative hygiene and animal welfare standards to support the food safety value chain. By successfully implementing ATP testing and SureTrend software globally, Aviagen revolutionized their approach to environmental monitoring, setting new benchmarks in the poultry industry. They no longer had to send instruments out for service or calibration. Dr. Friel

continued, "Hygiena also offers a CalCheck pen so that the user can carry out calibration verification on site. This is more time-efficient for us as a business. The system is also supported by continual software updates, ensuring smooth operation for the end user. Finally, Hygiena swabs can be stored at room temperature for up to four weeks," making it easy for operators out in the field.

As Aviagen continues its growth journey, Hygiena remains a trusted partner, offering tailored solutions to meet their evolving needs and ensuring the continued safety and quality of their products. "Overall, the system is easy to use, provides visibility on results across all sites and gives us an effective tool to monitor efficiency of cleaning," commented Dr. Friel. "Our goal was to find a cleaning verification tool that fits our needs - we have found that through you [Hygiena]" summarized Steven Campas, a Senior Microbiologist for Aviagen.

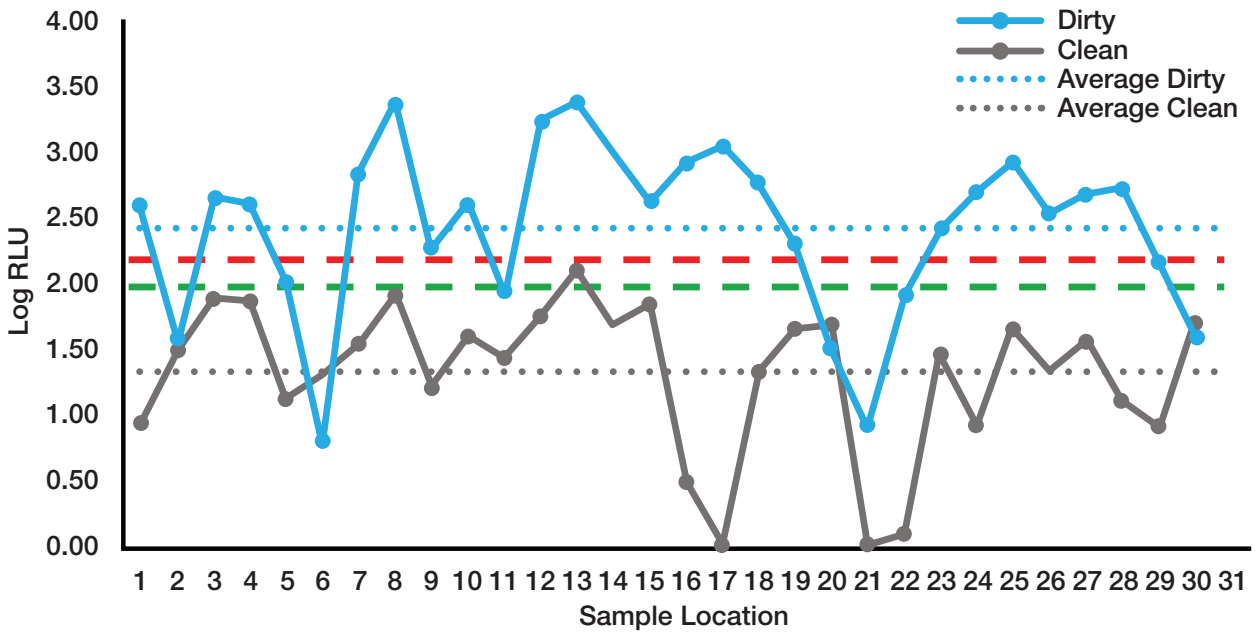


Figure 1. Standard Process Control (SPC) Chart of Cleaning Verfication in Various Hatchery Locations using the Hygeina ATP System (N=300 Samples).

*Each point is 5 samples.

Above the red line indicates a fail threshold based on implemented baseline.

Below the red line but above the green line indicates a caution threshold based on implemented baseline.

Below the green line indicates a pass threshold based on implemented baseline.

Note:

- The range on the Dirty data is wide, from 0 RLUs up to 11,675 RLUs. This is not uncommon and means that the surfaces tested have different recontamination rates. Some remain cleaner than others; this produces RLUs that are low and do not change dramatically when cleaned.
- The range on the Clean side is from 0 RLUs up to 395 RLUs, showing that efficient cleaning overall is being performed at a rate of 96.6%.
- To calculate the PASS CAUTION, FAIL levels, we will calculate using the 3x multiplier and the Mean + 3 Std Dev method.

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Analysis:

1. Multiplier Method
   - The mean of the clean data is 35 RLUs; multiplied x 3 = a FAIL threshold of 105 RLUs.
   - Using this criteria: Results show 207 Clean data points and 93 Dirty data points; a 69% - 31% split.
2. Mean + 3 Std Dev Method
   - The mean RLU of the clean data is 35 RLUs; the Std Dev = 50 RLUs; producing a FAIL threshold of 185 RLUs.
   - Using this criteria: Results show 226 Clean data points and 74 Dirty data points; a 75% - 25% split.
3. Combining these methods for analysis produces the following PASS/FAIL/CAUTION thresholds
   - PASS: <105 RLUs
   - CAUTION: <185 RLUs but >105 RLUs
   - FAIL: >185 RLUs
   - This produces the following results: PASS, n=207; CAUTION, n=19; FAIL, n= 74