Utilising Hygiene Monitoring Data to Meet Regulations and Optimise Processes and Use of Resources

In the food industry, doing business globally is challenging, partly because you must meet complex local, regional and country regulations. To meet those regulations, which are often enforced through audits, you must collect various data. A critical type of data, collected daily, relates to hygiene monitoring for verification of cleaning. Other data may include production environmental conditions, manufacturing performance and product quality. Yet, manually collecting, storing, retrieving and analysing such data can be time-consuming and resource-intensive.

Of 10,000 citations issued to food manufacturers in 2017 by the United States Food and Drug Administration, more than 60% were related to cleaning and sanitation.[1]

An automated hygiene monitoring and management system can help you efficiently collect, store and retrieve data to effectively prepare for scheduled and unplanned audits. An automated system can also take the data you have already collected and turn it into actionable information. This information can help you recognize opportunities to optimise your processes and use of resources. Leveraging these opportunities can help your company meet complex regulations and potentially gain competitive advantages.

Using hygiene monitoring data for cleaning verification and audits

To meet minimum regulatory requirements, you should have established a basic environmental monitoring program with sanitation standard operating procedures (SSOPs) that include cleaning and sanitation requirements. This enables you to use adenosine triphosphate (ATP) testing for hygiene monitoring on a daily basis to verify that cleaning has been done effectively so you can confidently make the high-risk decision to start food production.

The ATP data you collect during hygiene monitoring can also be used for scheduled and unplanned audits. However, in today's global market, simply showing you have been monitoring may not be sufficient to pass an audit. You also should use effective pass/fail limits, identify trends in your results and be able to show your corrections have been effective to demonstrate you are actively managing your cleaning and sanitation problems.

Your daily monitoring process is likely to include multiple steps such as selecting test points, swabbing designated test points, manually logging the results on paper then transferring them to a daily sheet in a binder. That data may be transferred to a weekly binder, then to a larger binder and possibly put into an electronic spreadsheet. Once the data is stored, perhaps offsite, some of it must be kept for up to two years or the shelf life of the product, if longer than two years.

To prepare for an audit, that data must be retrieved quickly, then analysed and prepared for presentation and review. But using a manual system and paper files to manage such a large volume of data can become a challenge, especially if your time and resources are limited.

Instead, new systems are available to collect and automate data management. These systems can organize thousands of test points, create sample plans, schedule plans, randomize sites to be swabbed, and collect and store test results, then quickly and efficiently retrieve data for analysis and audits.

An automated system can easily identify trends, for instance, in fails, times of day or during particular work shifts, and highlight growing problems that need immediate attention. The results can also show whether your corrections and corrective actions have been effective.

During audits, an automated system can enable you to present information in well organized, detailed, electronic documents that can help demonstrate your diligence in hygiene monitoring and compliance with regulations.

> Doing hygiene monitoring is not enough anymore. Utilising your hygiene monitoring data effectively allows for continual improvement of the quality and safety of your products.
>
> –Randy Worobo, Ph. D., Professor of Food Microbiology, Cornell University

Utilising data to optimise your processes and resources

Hygiene monitoring is mandatory so you are required to collect and store cleaning verification data. Yet instead of keeping data only for audits, utilising an automated hygiene monitoring and management system can efficiently and effectively turn your data into valuable information that you can use to optimise your processes and use of resources.

Process optimisation can include using data to take effective corrective and preventive actions (CAPA) for continuous improvement and support of a food safety culture that engages staff. Resource optimisation can involve using data to identify and address emerging and urgent hygiene problems, justify investments in time, staff and finances, and make cost-effective use of supplies.

Managing the data you are already capturing, by using an automated hygiene monitoring and management system can give your company the opportunity to gain a valuable competitive advantage.

The difference between data and information

Data
(da·ta):

"Data are 'discrete, objective facts or observations, which are unorganised and unprocessed and therefore have no meaning or value because of lack of context and interpretation."[2,3]

Information
(in·for·ma·tion):

"Information is differentiated from data in that it is 'useful.' Information is inferred from data2 thereby making the data useful4 for 'decisions and/or action."[5]

Information can also be described as "organized or structured data, which has been processed in such a way that the information now has relevance for a specific purpose or context, and is therefore meaningful, valuable, useful and relevant."[2,6]

Process Optimisation

Taking corrective and preventive action (CAPA)

During hygiene monitoring, the results from a single swab or individual piece of data may indicate a pass or failure but cannot tell you if those results are better or worse or the same as those of the previous day.

Instead, you must be able to see data trends — for a piece of equipment, a processing line or activity on a work shift — to determine whether problems exist, or cleaning has been effective.

An automated hygiene monitoring and management system can easily and quickly help you determine:

- Is cleaning under control?
- Which test point fails most often?
- Are there problems with a specific piece of equipment?
- Was there a single day when failures occurred across a high percentage of test points?
- What are the patterns of failure over the past weeks?

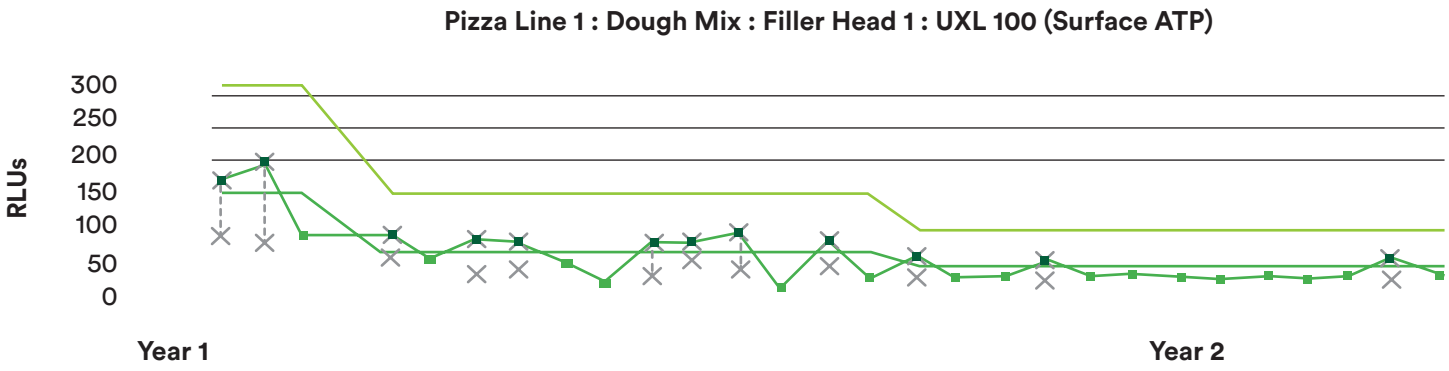
During audits, this information can help you demonstrate that when problems occurred, you efficiently identified and addressed their root causes by taking corrective and preventive action and bringing cleaning under control again.

Pursuing continuous improvement

The trends in data that you observe while taking corrective and preventive actions can also be used to establish a program for continuous improvement. Most automated systems should be able to easily collect and organize data. Advanced systems can trend data, allowing it to be visualized to show the impact of changes in your cleaning and sanitation parameters, such as water temperature, chemical concentrations, sanitizer changes and training of staff.

To begin, you need to evaluate data to establish baselines then you can set desired goals and benchmarks for improvement. Once those goals have been reached, you can pursue continuous improvement by reducing your pass/fail limits.

Using a continuous improvement program, you can show that your proactive steps are having positive impacts, ensuring prior problems are not recurring and your results are continually improving.



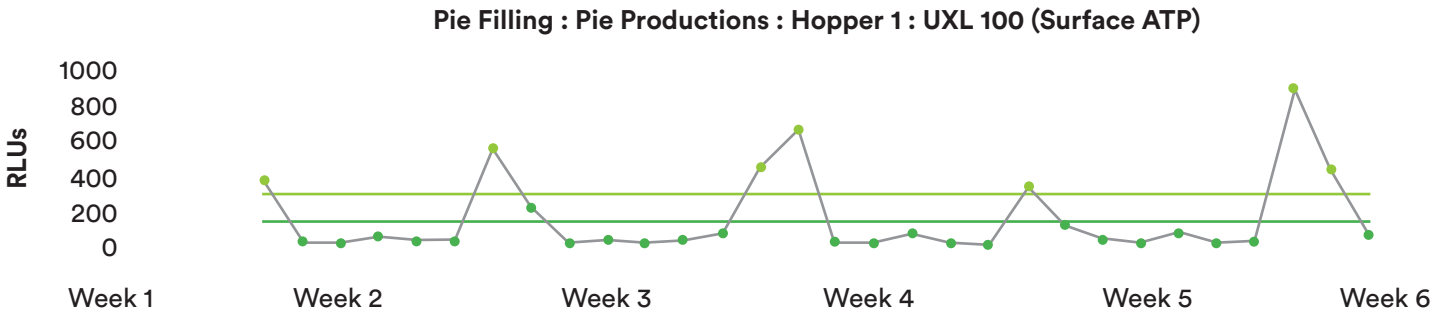
Continuous improvement through regular lowering and monitoring of pass/fail levels should be a common practice. In this example, continuous improvement in test results was observed with each reduction in pass/fail levels.

Supporting a food safety culture and engaging staff

Another aspect of process optimisation involves the establishment and pursuit of a food safety culture. Building a food safety culture has become a critical component of many companies' strategic plans in recent years, due in part to mergers and acquisitions as well as multicultural and generational differences in staff.

Sharing information allows staff to see the impact they have on cleaning and sanitation, manufacturing and production processes. It also can build mutual trust and enable them to evolve from only participating to becoming engaged in the overall process, giving them a sense of ownership, accountability, responsibility and commitment.

Sharing data and information can show when training may be needed, where improvements have been made, staff's positive impacts on performance and opportunities to recognize and reward staff.



Information generated from data can highlight cleaning and sanitation problems that need improvement. For example, results may be acceptable Monday through Friday but consistently unacceptable on weekends. This may indicate that weekend staff needs additional oversight or training.

Resource Optimisation

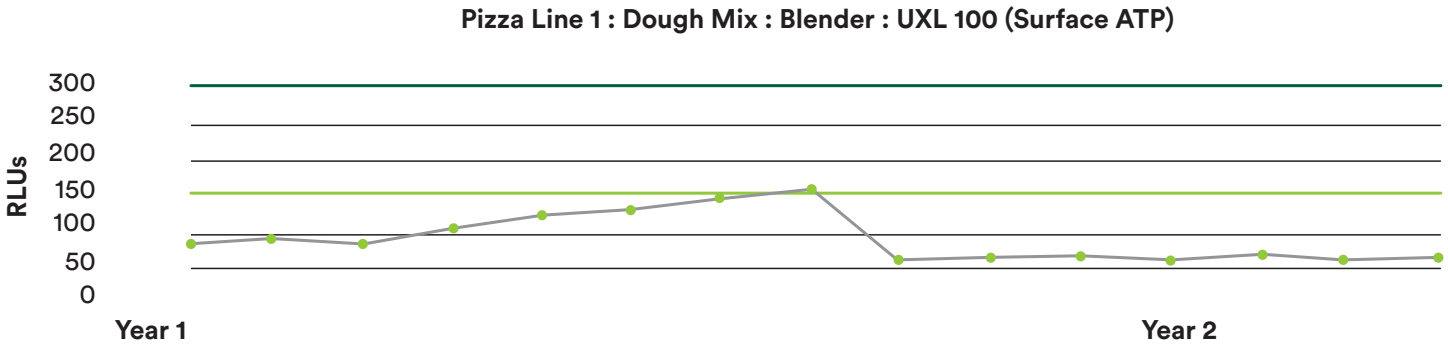
Protecting consumers, your customers and your business

A hygiene monitoring and management system and the information it provides can support you in effectively utilising your resources to proactively manage and protect your business.

Information generated by trended data allows you to identify whether an escalating problem exists somewhere in your plant. If information shows your plant does have a hygiene problem, it is imperative that you immediately align your resources to address it.

In contrast, failing to collect and properly manage data, having a poor documentation system or ignoring cleaning and sanitation problems could be threatening in multiple ways. You may fail customer audits and, as a result, lose customers' trust and business. You could fail regulatory audits, which would require extra expenditures to address and correct hygiene problems. That could put your company under additional scrutiny in the future. A worse-case scenario would be a product recall, which could place consumers' health at risk, permanently damage your company's brand and reputation and jeopardise your company's future.

Taking corrective action is crucial to protect consumers and your customers as well as the short-term and long-term health of your brand and business.



As shown in this example, monitoring data over longer periods of time can enable you to identify escalating problems and proactively take action to help bring them back under control before those problems become failures.

Justifying your investments

Every business has limited budgets, time and staff so it is imperative that your resources are prioritized around activities in your plant where results will have the biggest impact. Information from a hygiene monitoring and management system can help you decide where to align your staff, time and capital more effectively.

Collection of additional data can show the impact of the allocation of your resources. The data can also show that your investments have been worthwhile, highlight opportunities for savings and provide justification to support your requests for additional investments and resources.

All Fails Details

Test Point	Sample Plan	Test Type	Fails	% Fails	Trend	Test History
Dough Station 1	Pizza Line 1	ATP	6	10%		

After a failure is identified and resources are aligned to take corrective action, continued monitoring will demonstrate those impacts and can support your requests for additional resources.

Cost-effective use of supplies

Data and information can also facilitate cost-effective supply management by helping you select appropriate cleaning supplies, determine their best frequency of use and evaluate their performance.

Once your cleaning process is under control and consistently generating desired results, information generated by trended data can give you the confidence to try new cleaning procedures.

Changes to your processes may optimise your SSOPs and use of supplies, yet still meet your cleaning requirements. This can facilitate cost-effective supply management that produces required levels of cleaning without wasting or overspending on supplies. Also, as problematic areas become less likely to produce failing results, you could reduce the extent and frequency of their cleaning and testing.

Utilising an automated hygiene monitoring and management system to compete globally

Hygiene monitoring is mandatory to verify that cleaning has been effective. Companies that compete globally recognize the opportunities that an automated hygiene monitoring and management system can provide. Opportunities can include efficient and effective preparation for scheduled and unplanned audits and turning data into valuable, actionable information that can be used to optimise processes and use of resources.

An automated system can help optimise SSOPs and processes related to corrective and preventive action (CAPA), facilitate continuous improvement and build a food safety culture that engages staff. For resource optimisation, a system can show you where to effectively align your resources, the impact those resources have had and can provide the data to justify requests for additional staff. Companies that pursue these valuable opportunities can give themselves potential advantages in the global market.

Learn more about hygiene monitoring at **info.neogen.com/Clean-Trace**

[1] United States Food and Drug Administration, Inspection Observations. https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/inspection-references/inspection-observations.

[2] DIKW Pyramid, Wikipedia, https://en.m.wikipedia.org/wiki/DIKW_pyramid.

[3] Rowley Jennifer, Hartley Richard (2006). Organizing Knowledge: An Introduction to Managing Access to Information. Ashgate Publishing, Ltd. 5–6. ISBN 978-0-7546-4431-6.

[4] Bellinger Gene, Castro Durval, Mills Anthony (2004). Data, Information, Knowledge and Wisdom. http://www.systems-thinking.org/dikw/dikw.htm.

[5] Liew Anthony (June 2007). Understanding Data, Information, Knowledge and Their Inter-Relationships. Journal of Knowledge Management Practice. 8(2). http://www.tlainc.com/articl134.htm.

[6] Rowley Jennifer (2007). The Wisdom Hierarchy: Representations of the DIKW Hierarchy. Journal of Information and Communication Science. 33(2): 163–180.

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