The ABCs of ATP

The Neogen® Clean-Trace® Hygiene Monitoring and Management System tests for the presence of ATP to quickly and easily indicate if a facility has been cleaned effectively so manufacturing can begin. ATP testing is a universally-accepted method that can provide confidence and peace of mind when making decisions and managing risk.

A comparison of testing methods and their roles in food manufacturing

It is critical to quickly determine if cleaning has been effective so food manufacturing can begin. Visual inspection, ATP testing and microbiological testing have different roles in the verification and risk management processes.

Visual inspection can quickly provide a big-picture view around the effectiveness of cleaning. Visual inspection has limitations because trace levels of contamination cannot be seen by the naked eye. In addition, there may be surfaces on production equipment that cannot be visually inspected but may be contaminated. Visual inspection can be a precursor to ATP testing but should not be a substitute for it.

Microbiological testing cannot provide immediate results on the manufacturing floor. Samples must be taken to other locations for processing and analysis. While microbiological testing can help identify specific organisms, it requires days to produce results. During that time, either food has to be held, potentially reducing shelf life and sales, or food can be released but may need to be recalled if contamination is found.

ATP testing is highly efficient because it quickly and easily provides results. It measures whether cleaning has been effective and manufacturing can begin, or show that re-cleaning and re-testing are necessary to reduce contamination before food processing starts.

A definition of ATP

ATP (adenosine triphosphate) is a chemical found in every cell of living organisms. It stores energy and gives cells energy they need to function.

(Robson, Kelly. Education Portal. ATP: Definition, Molecules & Quiz. http://education-portal.com/academy/lesson/atp-definition-molecules-quiz.html)

How ATP testing works

ATP testing systems rapidly determine the amount of ATP present in areas that have been cleaned. If ATP is detected, the test produces light. The more light produced, the greater the contamination.

> “The use of this technique for monitoring allows information to be provided in time for corrective action to be taken. This maintains control of the process, thus avoiding recall campaigns, adverse publicity or even food scares, all of which would ultimately end in reduced sales and/or profits.”
>
> – Hawronskyj, et al., Trends in Food Science & Technology

What the experts say about ATP testing

The scientific literature supporting the food industry has numerous studies on the benefits of ATP testing. These include ease of use, accuracy and speed of results that let manufacturers confidently manage food manufacturing processes.

Hawronskyj, Jane-Marie and Holah, John. "ATP: A universal hygiene monitor." *Trends in Food Science & Technology*, March 1997, Volume 8, Issue 3, Pages 79–84.

- Monitoring methods should be able to provide information in time for corrective action to be taken, maintaining control of the process and negating the need to reject the product or begin recall campaigns.
- In order to evaluate a sanitation program effectively, it is important to obtain results rapidly.
- ATP (adenosine triphosphate) bioluminescence provides a reliable and rapid alternative to traditional microbiological techniques.
- The use of this technique for rapid hygiene monitoring allows the information to be provided in time for corrective action to be taken.
- This maintains control of the process, thus avoiding recall campaigns, adverse publicity or even food scares, all of which would ultimately end in reduced sales and/or profits.

Dostálek, Pavel and Bráynyik, Tomáš. "Prospects for rapid bioluminescent detection methods in the food industry — A review." *Czech Journal of Food Sciences*, 2005, Volume 23, Number 3, Pages 85–92.

- Any direct test for contamination must be rapid enough to be compatible with HACCP.
- The total amount of ATP present on a surface can be extracted through swabbing and assayed extremely rapidly.
- The result indicates the overall contamination of the surface.

J.A. Poulis, M. de Pijper, D.A.A. Mossel and P.Ph.A. Dekkers. "Assessment of cleaning and disinfection in the food industry with the rapid ATP-bioluminescence technique combined with the tissue fluid contamination test and a conventional microbiological method." *International Journal of Food Microbiology*, November 1993, Volume 20, Issue 2, Pages 109–116.

- Either method (ATP bioluminescence testing or microbial culture) is useful to check cleanliness of food industries.
- ATP measurements have the great advantage, in that it is a fast method and is easy to perform.

> "Just as you would monitor and do preventive maintenance on a piece of equipment to keep it operating efficiently, you must monitor the effectiveness of your cleaning processes."
>
> –Rolando J. Gonzalez, PhD, Senior Director of Technical and Scientific Affairs, Acheson Group

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

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