

LIMS Helps Ajinomoto Ensure Product Quality and Safety



Ajinomoto (Malaysia) Berhad is a subsidiary of Ajinomoto, the company founded by the discoverer of monosodium glutamate and the world's leading supplier of the flavor enhancer. The company carefully tests its products and documents their quality in order to ensure consumer safety and satisfaction. Ajinomoto Berhad has recently substantially improved its laboratory operations by implementing a laboratory information management system (LIMS) that automates the flow of information from sample collection all the way through to preparation of

certificates of analysis. "Our technicians save a considerable amount of time that they previously spent entering data, making calculations and preparing reports," said Mulkit Singh, Quality Assurance Manager for Ajinomoto (Malaysia) Berhad, Kuala Lumpur, Malaysia. "Since we implemented the new software the productivity of our technicians has been increased by 25% and our documentation has been error free."

Key Benefits

- ▶ Comprehensive implementation ensured project stayed on time and on budget
- ▶ Process Scheduler automates login and eliminates skipped tests
- ▶ Easy interfaces to PerkinElmer instruments
- ▶ Trend Plots allow QA to track manufacturing or environmental processes

In 2008, Professor Kikunae Ikeda of Tokyo Imperial University was the first to discover that the amino acid glutamate was the source of Umami, a distinctive taste found in many savory foods throughout the world. One such food, Kombu Dashi, a soup stock made with kelp, had long been used as a base food cooking ingredient in Japan. After successfully isolating glutamate from Kombu Dashi, Dr. Ikeda invented monosodium glutamate which has since been used to give a savory taste to many types of foods. Today, Ajinomoto has 15 factories around the world and supplies about one-third of the 1.5 million tons of monosodium glutamate consumed in the world each year. Ajinomoto (Malaysia) Berhad began operations in 1961 and has since grown into a dynamic food seasoning manufacturer providing seasonings that are used in almost every Malaysian home.

Continuous testing ensures quality and safety

Technicians at Ajinomoto (Malaysia) Berhad's plant perform a battery of tests on every batch to ensure the quality and safety of the company's products. In the past, the laboratory used Excel spreadsheets to track the flow of work through the lab, capture the test results, generate statistical process control trend charts and prepare reports for customers. One problem with this approach was that a considerable portion of the technicians' time was tied up doing data entry and formatting data for reports. Management was also concerned with the potential for errors such as incorrectly keying in the results of a test or transposing data in a spreadsheet.

"Our laboratory staff was performing at a high level but they were hindered by the need to spend so much time manually managing data," Singh said. "Another concern was that our quality assurance system depended too heavily on the performance of individuals. We wanted to automate our information collection and reporting in order to ensure that our customers could have absolute confidence in our documentation. We performed an in-depth study of several LIMS software packages. PerkinElmer's LABWORKS stood out, first of all, because it is so easy to use. We carefully evaluated LABWORKS against our requirements and gained confidence that it could meet our needs. We visited a LABWORKS user and discovered that their experience was very positive. One additional factor in our decision was that we own a number of PerkinElmer instruments and we were impressed by how easy it was to connect them to the LIMS."

Implementation involves joint effort

The implementation was a joint effort between Ajinomoto and PerkinElmer. "We formed a team that included Shyarmala Kanessin, a Senior Chemist at Ajinomoto, information technology department staff members, laboratory users, PerkinElmer engineers and myself," Singh said. "We worked together to ensure that PerkinElmer understood our products and processes and that we understood the capabilities and requirements of the software. By the end of this process, both PerkinElmer and Ajinomoto participants spoke the same language and worked together as a single team. The cost and time involved in implementation was reduced by the

fact that LABWORKS is a very flexible software package. It was able to handle all of our requirements without any customization."

The implementation of the new software has automated most of the procedures involved in capturing and processing laboratory information. The LABWORKS Process Scheduler is used to automatically log in samples for tests, such as instrument calibration that are performed at set time intervals. The vast majority of the testing is product-specific. After a batch has been produced, production staff collect samples and log them into the LIMS. The software automatically generates labels for each test. The automated login process saves time and nearly eliminates the possibility of skipping a test. The samples are then sent to the lab and someone there confirms them and distributes them to the proper technician.

Results move into LIMS through interface

Ajinomoto technicians use instruments such as Fourier Transform Infrared (FT-IR) spectroscopy, atomic absorption spectroscopy (AAS), ultraviolet (UV) spectroscopy and high performance liquid chromatography to ensure the identity and potency of raw materials, in-process materials and finished products as well as ensure against contamination. PerkinElmer provided interfaces to all of these instruments so test results are now entered automatically into the LIMS without the time or potential for error associated with manual data entry.

As soon as the test is completed, the results move into the inbox of the person that is responsible for

approving them. This is a chemist in the case of chemical tests and a microbiologist in the case of microbiological tests. Any calculations required on the test results are now performed automatically. In some cases, the instruments perform the calculations prior to uploading the information to LABWORKS. In other cases, LABWORKS automatically passes the data to Excel to perform the calculations and then reads the results from the spreadsheet.

Workflow incorporates process trending

The data then goes to a quality assurance person to study process trends. The LABWORKS Trend Plot program provides users with the ability to graphically display a series of result values for groups of selected parameters and location codes in real time. The trend plots are automatically updated every time a sample is analyzed. These trend plots can be used by personnel outside the laboratory for tracking manufacturing or environmental processes in a plant or by workers in the lab for tracking instrument performance and calibrations.

The LABWORKS Process Scheduler provides a window into the status of every sample in the laboratory. Authorized users can simply click on any sample to determine its status. They can also use the Process Scheduler to generate a list of samples that are waiting for analysis or waiting for validation. The Process Scheduler has also been provided to production and research and development so they can track the status of their samples. Each unit is set up to see only their department's samples. Ajinomoto also provides customers with the

ability to log in and check the status of their own jobs.

If the test results are positive, the LIMS automatically generates the certification of analysis based on the testing results and other documentation that may be required by the customer. The LIMS will not release the certificate of analysis unless the batch has actually passed all required tests. This eliminates the need to leave this important documentation to the discretion of the technician. The LIMS will then send an alert to production that the shipment is ready to be released to the customer. If the test results are negative, then the workflow passes them to Singh who initiates an investigation. The software also maintains an audit trail of all of the data generated by the laboratory.

Not one single documentation error since LIMS was implemented

“In the past, our people spent a lot of time generating data and writing reports,” Singh concluded. “The ability of LABWORKS to automate many labor-intensive data collection and management tasks means that eight technicians can now do the work that required 10 people in the past. The flexibility of the software means that we have been able to achieve nearly everything we wanted without having to undergo and expensive and time-consuming customization process. Most important, since we installed the LIMS we have not experienced a single error in the issuance of quality documentation.”

“Our ability to respond quickly to our customers' requirements without compromising the quality of our products or the integrity of our documentation is critical to our

success,” Singh said. “By providing an automated and error-free source of quality information, LABWORKS has become a vital part of our operations. An important aspect of our positive experience has been the excellent relationship that has developed between PerkinElmer and Ajinomoto. PerkinElmer has demonstrated their commitment by providing excellent technical support that keeps us up and running on a continuous basis. We are looking forward to working together with them to reach the next level.”

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