

PROCESS CHEESE CASE STUDY: Whitehall Specialties

ESE
Engineering Solutions Experts



*Optimizing the Process.
Maximizing Your Profits.*

Case Study: Accurate Content Analysis Reduces Labor, Increases Profits



ESE, Inc.
Engineering Solution Experts
3600 Downwind Drive
Marshfield, WI 54449
www.ese1.com

Accurate Analysis Reduces Waste, Increases Profits

Case Study for Whitehall Specialties

Executive summary

Imagine you create a recipe. Define the constituent parameters of that recipe. Test. Taste. Rework. Finalize the recipe and put it into production. Now, make sure the constituents of that recipe are consistent in every batch, every time. You've committed to bringing customers from R&D to market in record time, while making a profit for yourself, but your current lab protocols don't allow for test results to be returned until three batches after the current run, resulting in extra waste and labor usage. That's exactly what Whitehall Specialties was facing before implementing the new Q5L Lab Analyzer from ESE, Inc. – Engineering Solution Experts. Today, with the ability to make real-time adjustments Whitehall has seen a significant reduction in the amount of product produced out of spec decreasing the amount of product rework required by nearly 30%, the amount of resources wasted by 50%, and the amount of labor expended by 30%.

They are now running three lab analyzer units in three plants, all of which have proven a payback in just months.

Company profile

Whitehall Specialties, located in Whitehall, Wisconsin, is a world leader in custom analog and process cheese style products. Whitehall Specialties provides their customers a dedicated development laboratory where research engineers design custom products, test new ingredients, explore innovative processes and prepare custom cheese samples.

By definition, analog cheese is the broader category for substitute, imitation, alternative or processed cheese products made with dairy or non dairy proteins and alternative oils or dairy fat in place of milk solids. Whitehall Specialties custom manufactures any cheese product to client specifications or their research and development department will customize a product to meet an application's requirements. Examples are blends of natural cheese, analog cheese, zero cholesterol, low sodium, increased or decreased protein and lactose free. Whitehall Specialties can also alter melt points, shred ability, taste and color.

Business situation

Whitehall Specialties is committed to taking a customer from research & development to market with custom cheese products, imitations or blends in record time. Current lab protocols, while focused on quality, were also time consuming and costly. Previously, Whitehall Specialties required quality testing that didn't return results until 3 batches after the current run. This meant valuable time was sacrificed, while unnecessary raw material waste and labor usage also ran much too high - resulting in Whitehall's need to make a strategic decision - either add additional labor or invest in a faster way to get results to the process floor.

Solution details

Whitehall Specialties' existing wet chemistry process always presented an issue in gaining timely analysis and resulted in significant delays at line. ESE reviewed Whitehall's existing processes and needs and presented the Q5L Lab Analyzer as the solution based on its speed, multi-constituent analysis capability and reliability. Whitehall Specialties selected ESE based on the Q5's performance at presentation, especially compared to other IR and NIR instruments reviewed by Whitehall in the past.

Where Whitehall's existing protocols could take up to three batches later to get results, the Q5L provides accurate results in as fast as five seconds, allowing much of the existing manpower to be deployed elsewhere in the lab or throughout the plant. The Q5L allows Whitehall to test at points during the process when minor adjustments can be made to meet final product specifications. Given that Whitehall possesses over 200 recipes, each containing multiple constituents, the Q5L can analyze 10 or more constituents at once including fat, protein, total solids, moisture, and lactose which are key to Whitehall's tolerances.

Whitehall Specialties touts its quality control as a key differentiator to its potential customers including annual third party GMP audits of each facility, so they were keenly interested in the reliability of the Q5L, especially the accuracy and repeatability of each sample measurement. Whitehall Specialties gave the Q5L a positive assessment and chose to implement ESE's technology rather than hire additional personnel.

Initially, Whitehall was leery to trust its reputation and product quality to an entirely new system that was contrary to procedures in place for the past 15 years. The goal for implementation was established prior to acceptance of the project and was defined as providing real-time analysis to

production supervisors allowing for faster responses to off spec products ultimately reducing rework amounts. Whitehall Specialties and ESE were in complete agreement on the outcome based on the customer's needs as well as ESE's past experiences. In addition, timelines, budgets and success factors were established prior to initiation of the project with clear communication channels established.

Technical details

Whitehall Specialties' existing wet chemistry process always presented an issue in gaining timely analysis and resulted in significant delays at line. Their previous protocols required time-consuming testing that didn't return results until three batches after the current run. ESE's Q5L lab analyzer did not replace any traditional equipment at Whitehall Specialties; in fact, standard methods are still in place after simple calibration and validation of the new Q5L were completed.

The Q5L couples the most modern analysis technology available on the market - Near Infrared transmission (NIRT) technology - with ESE's own Process Optimizer software. Near Infrared transmission technology has come a long way since its early days some 30 years ago. ESE has found innovative ways to adopt this technology into their patent pending Q5L product. NIRT uses relative light absorption to quantitatively predict a constituent's content in a safe, sanitary environment. Considering Whitehall's commitment to quality, it was important for them to know that the diagnostic power of the light has no negative damaging affect on the product.

Whitehall found the laboratory testing process with the Q5L to be quite simple - put product into the sample bag, then into the holder, then into the analyzer for testing. The sample requires minimal prep and clean-up. The stand-alone unit features a space-saving design which is essential in cramped lab environments.

Additional services

Training for Whitehall Specialties was conducted on-site with an ESE technician so all of the critical players in the project knew how the equipment functioned. From set-up and calibration to testing and lab adjustment, the customer was able to follow and stick to the schedule. Calibration and validation work was all completed by Whitehall Specialties with guidance and statistical feedback from ESE throughout the entire process. Each calibration test was reviewed by ESE and results discussed before moving on to the next validation phase.

Solution benefits

The implementation of the Q5L has resulted in significant operational and financial benefits for Whitehall Specialties.

- Improved labor utilization – the ease of using the Q5L has moved testing from the lab’s responsibility to the operator’s responsibility, resulting in redeployed labor and eliminating the need to hire additional staff to handle the increased volume
- Increased speed – accurate testing results in as few as 5 seconds compared to the previous testing process that took up to a minute per test to complete and hours to report
- Reduced waste - immediate alterations to constituent values are performed in-process rather than waiting 3 batches after the current run to make changes - resulting in improved batch quality and reduced waste
- Added testing – freeing up manpower means more time for additional lab tests - both increased volume of existing tests and adding a variety of new tests
- Additional cost savings – reduction of raw materials and consumable supplies have realized cost savings of nearly 20% and maintenance costs have been reduced due to the design of no moving parts in the Q5L

Additionally, Whitehall Specialties found the Q5L to be very user-friendly with easy set-up, use and maintenance. By simply putting product into the sample bag, then into the holder, the sample requires minimal prep and clean-up. The small footprint of the Q5L’s space saving design also benefited Whitehall’s limited lab space. Whitehall also found the engine of the Q5L - ESE’s Process Optimizer software – to be very intuitive and easy to follow.

Results

One of the more challenging obstacles to implementation was the sheer number of recipes Whitehall Specialties runs as part of its portfolio. The Q5L measures the ingredients of processed cheese very well; the question was how to organize the recipes in a logical format to best organize the constituent ranges. The solution was to develop groups containing similar component ranges for all recipes whereby recipes in that group would be in the same calibration.

Once the initial grouping was complete, it was reviewed and approved with the customer. This not only simplified calibration but case of use as well.

After the calibration and testing process, it was discovered that salt results were not as reliable as those for moisture and fat. ESE continues to work with Whitehall Specialties to modify test methods to produce reliable, repeatable salt constituent testing. Immediately following implementation, Whitehall Specialties began to push itself and was able to see the time benefits of the instrument. However, it truly became apparent when personnel was able to make adjustments to the current batch instead of the previous protocol where results would be received three batches later and the two intermittent batches would be wasted. Being able to make real-time adjustments significantly reduced the amount of product produced out of spec decreasing the amount of product rework required by more than 30%, the amount of resources wasted by 50%, and the amount of labor expended by 30%.

As part of their commitment to engineering expertise, ESE provided Whitehall Specialties with an ROI calculator early on in the sales process. Not only did the ROI calculator help Whitehall build a business case to cost justify the initial investing in the Q5L product, they have continued to monitor other costs including labor, raw materials, lab costs, and consumables. The calculation continues to prove out that the efficiencies gained in their operation more than recoup their initial and subsequent investments. "This technology has the potential to take testing from a reactive level to a proactive level. It has allowed the QC department to focus efforts on the root causes of off spec product rather than just reacting when it occurs" states Carl Peterson, Lab Supervisor with Whitehall Specialties.

More specifically, Whitehall found that they quickly recouped the investment on the initial Q5L making it easy to justify the purchase of a second analyzer for a second location, followed up by a third plant just a short time later. Future savings may also have been saved as no further discussion has been needed regarding the addition of personnel. In fact, the Q5L is viewed as user-friendly and has reduced the involvement of lab personnel allowing production to become involved with testing.

Today, Whitehall enjoys the security of knowing their solution comes with an annual Productivity Pak agreement from ESE which provides technical telephone and email support during regular business hours in the event that they need it. To date, Whitehall has required little to no technical support due to the ease of operating the Q5L.