Dairy Case Studies

Case Study Collection
Food Safety, Quality and Productivity

METTLER TOLEDO
Improve Processes & Quality Control
While Reducing Production Costs

Applications

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Fun Food Beyond Refreshing
With Complete Formulation Control

As the “Makers of Fun Food” experience a growing business volume, the Jel Sert Company was not about to sacrifice the product quality that has long been one of their trademarks. A FormWeigh. Net® formulation system was installed which enabled them to achieve improved efficiency, quality, and traceability.

From humble beginnings in 1926, the Jel Sert Company has been a family owned private business dedicated to providing high-quality and high-value food products. Their manufacturing facility located in West Chicago, Illinois, USA produces freezer bars, desserts and beverage mixes. Brand names, such as Fla- vor-Ice and Otter Pops, have been well known for generations.

Improved batching control with high visibility
With the increase in production demands due to growing business and a commitment to maintain product quality, the company needed to gain greater control in their manufacturing processes. A reduction in clerical activities, elimination of documentation errors, and prevention of batch mistakes were goals for improvement. Jel Sert decided to invest in METTLER TOLEDO’s FormWeigh.Net formulation system.

“We needed a system to help streamline and control our formulation process, while at the same time providing greater visibility and traceability of our raw material management,” says Andy Rush, executive VP of operations for Jel Sert.

Dramatically reduced error rate
Jel Sert installed six weighing stations, including two mobile stations, with the
FormWeigh.Net software and ID30 industrial PC terminals. Each station also has weighing platforms, barcode readers and label printers attached for process tracking. The system guides the operators through each step of the formulation process to ensure a quality batch. Blending Manager Carlos Fregoso states that the batch accuracy has improved dramatically over the past 15 months and nearly 33,000 batches since the system was installed. “Errors are eliminated by scanning ingredients through the system. Wrong or expired ingredients are not allowed into the batch being weighed,” explains Fregoso.

**Higher weighing efficiency**

Efficiency of the weighing operations was improved as well. Raw material tracking labels are printed automatically, and replace previously handwritten information. The labels make prefilled bags easier to identify on the production floor. A manufacturing report is also printed automatically in the QA lab after each batch is weighed, providing a record of all raw material lot numbers and quantities used in the batch.

**More time for other projects**

Erika Sherer, quality-assurance manager, points out that FormWeigh.Net® has allowed for more efficient use of available resources in the lab.

“Instead of time used for verifying and manually transcribing lot numbers into the system, resources are now available to work on QA related projects, like performing incoming ingredient analysis and other process improvement projects,” says Sherer.

Of course the complete electronic documentation is a benefit that Sherer cannot overlook. “We now have a very robust tracing process for our ingredients with a higher than ever recovery rate of raw material.”

With FormWeigh.Net®, complete control is maintained in the streamlined manufacturing process and Jel Sert can continue to efficiently fulfill the high quality expectations of their customers.

www.mt.com/formweighnet

**Key customer benefits of FormWeigh.Net®**

- Consistent product quality with predictable results
- Increased production efficiency
- Prevention of material waste
- Elimination of bad batches
- Complete and automatic traceability
- Clear, concise representation of the formulation process
- Assured product safety and integrity

**Fast Facts for FormWeigh.Net®**

- Flexible configuration to match production process
- Hardware options tailored to workplace environment
- Modular software for scalability
- Robust network architecture with centralized database
- Fully searchable electronic documentation
- Seamless ERP integration
- Fast ROI < 12 months
Excellence in Net Content Control at Nestlé Dong Nai Factory

Producing millions of packages a day offers huge saving potential through smart optimization processes across all filling lines. Nestlé Vietnam improves manufacturing efficiency by using latest integrated Quality Data Management Solution.

When Nestlé Dong Nai started operations in the late nineties, it was very clear to the factory management that a state of the art net contents control system was exactly the right tool for the new factory. A networked PC based FreeWeigh system was deployed factory-wide; initially connecting to 4 sampling stations.

The challenge
Product varieties and throughput have drastically increased over the years. Efficient and effective Net Contents Control procedures are considered one of the key factors to remain successful in a competitive market environment. Besides controlling net contents, a computerized system is also expected to provide all relevant data and reports for a swift batch release.

Integrated quality data management
Today, products from numerous lines are sampled on 24 static 0.01g scales and one 100% In-line Checkweigher; all connected to the FreeWeigh.Net® Quality Data Management System through the factory-wide Ethernet LAN. Target weight, tolerance limits, sampling frequency and several other parameters for each product are stored in the system and alarm line operators, when it is time to take samples.

All sample data are analyzed, stored and archived in the FreeWeigh.Net SQL database. In case fill weights at any of the lines begin to drift away from the pre-set limits; the line operators are prompted...
for immediate adjustment of the filling process.

**Meet net content legislation and minimize overfill**

The consequent sample check of all production batches helps Nestlé to fulfil national and international Net Content Legislation assuring satisfied customers. At the same time product give away can be kept at an absolute minimum.

Mr. Vo Thanh Hau – QA Manager concludes: “FreeWeigh.Net is the perfect tool to optimize filling quantities while observing legal limits.”

> [www.mt.com/freeweighnet](http://www.mt.com/freeweighnet)

**Key customer benefits of FreeWeigh.Net®**

- Significant reduction of product overfill cost
- Compliance to legal fill requirements
- Standardized and simplified processes
- Online monitoring and alarming
- Short reaction time in production
- Automated reporting
- Scalable system implementation and enhancement
- ERP integration
- Fast ROI (<12 months)
Automated Blending
Reduces Costs from Operator Errors

In today’s competitive business environment, even small errors can be costly. In manual operations, the chance for errors is high. That is why a European supplier to the food industry decided to automate its material-blending process with technology that also would collect, store and process important data.

Although the business had only two-material formulas that needed automation, it used 10 different formulas, inputted manually by operators. That was tedious, time-consuming and prone to errors. Company leaders were also frustrated by the difficulty in obtaining process information.

For the experts at METTLER TOLEDO, the solution was clear. Its IND560fillplus terminal allows the storage, retrieval and rescaling of up to 25 four-material customer-specific formulas, building on the simple filling or dispensing abilities. Additionally, it can be simply added to any of the IND560 terminals.

**Accuracy and ease of use**

The IND560 offers increased product accuracy thanks to programmable spill values and log functions. With FillPlus, errors are reduced because formulas are saved into the IND560's memory. Operators no longer need to enter formulas manually; they can simply be retrieved from memory. FillPlus performs rescaling based on a percentage of the programmed target, percentage of the available amount of material in a formula, or a desired total formula weight. Any spills on the balance must be immediately cleaned to avoid weighing result errors.

By using the IND560 password function, the customer can specify which operators have the ability to change from one formula to another or change specific formula information.

In addition, enhanced automation is enabled because the IND560fillplus allows each of the 25 formulas to have their own
designated auxiliary outputs turned on and off based on the weight or production time requirements of each particular formula.

Collects, stores and transmits process data
When the company needed to collect important information that was crucial to operations or for their customers, it was difficult because their system did not readily collect data. Now with IND560fillplus, a variety of shared data is available, including alibi memory, formula ID, description, rescale information and total formula weight for all batches, or only for completed batches. This information can be stored, printed as a report or label or used to trigger actions.

www.mt.com/ind560fillplus-dia16

Weighing Terminal IND560fillplus
Fast Features
• Store up to 25 formulas and up to 99 material records
• Weigh from milligrams to tons
• Control manual, semi-automatic and automatic processes
• Connect your system to PLCs, LANs, WANs and the Internet
• IP69k protected
• Application-specific soft keys

Key Benefits
• Simplifying formula changeover
• Automatic formula rescaling based on a percentage of target weight or amount of material available
• Totalization-formula table can accumulate total weight produced per formula
• Application-specific shared data fields to print or record relevant data per single batch
Quality Cheese
Guaranteed by Top-Quality Instruments

First District Association, based in Litchfield, Minnesota, U.S., produces a wide variety of cheeses. Quality is of the utmost importance for First District. When the time came to renovate and remodel their testing labs, they chose the leader in quality instrumentation – METTLER TOLEDO.

Upholding high standards
First District Association is an independent dairy cooperative that maximizes returns for its producers and employees through innovation and providing progressive quality products to a global market. They play a prominent role in the dairy industry and have a very distinct and proud history which has influenced the birth and formation of modern dairy cooperatives.

First District produces a wide variety of cheese for use in all types of applications. They produce 500 lb barrels and 40 lb blocks, as well as whey protein concentrate (WPC) and lactose. Cheese produced by First District is used in processed cheese products, shredded cheese, and cheese sauces and powders. The new testing labs required updated equipment to help speed up production. First District was also interested in a way to move from manual result transcription to an electronic format.

Reliable moisture & ash control
First District prides itself on product quality. Each batch of WPC and lactose is lab-tested and must fall into a specific range of moisture and ash in order to meet the established standard. The moisture testing process begins by taking a small sample from each batch and weighing it. The sample is then dried out in an oven and weighed again. Determining the weight difference in the sample before and after the drying process provides a simple calculation for the amount of moisture present.

The ash testing process measures the amount of ash remaining in the sample after heating it in a muffle furnace. The remaining ash is weighed to ensure it falls within a standard range. First District chose the Excellence Plus (XP) series of analytical balances for both of these tests. They chose the XP for its speed and for the flexibility of the grid-style weighing pan for easy cleaning.

Correct pH level ensures quality
First District also tests the pH levels of each batch of cheese. They grind the cheese samples and pack them into sample cups. During pH testing, a combination electrode is inserted into the cheese.
The S40 pH meter then automatically reads the data and prepares it for output. Determining the correct pH level ensures the quality of flavor, body and texture of each batch of cheese.

To complete the package, First District purchased METTLER TOLEDO’s LabX Direct pH and Balance software. This software suite will be connected through a LIMS system as the remaining lab renovations are completed. LabX software eliminates the need to manually note each quality test. The connection to the LIMS system will send the results directly into a host computer which reduces the likelihood of transcription errors.

First District now has an up-to-date solution for their quality assurance testing.

Production is moving faster and the new equipment ensures the quality and taste of each batch of cheese produced. The addition of the LIMS system and software will further enhance and streamline the lab—completing the entire testing package.

www.mt.com/XPE-analytical
www.mt.com/sevenexcellence
www.mt.com/LabX
Measuring Ice Cream Meltdown Efficiently and Error-free

Determining the speed at which ice cream melts is an important factor in product quality. However, the quantitative measurement of the meltdown curve is labor-intensive and error-prone. LabX Software offers one ice cream manufacturer an easy, automatic and error-free solution.

Difficulties faced
The traditional method for determining the meltdown curve for ice cream involves the physical observation of it melting. A block of ice cream is placed on a net positioned above a balance at room temperature. The ice cream is collected in a glass tare container on the balance as it melts. The weight on the balance is registered every minute for three hours. The results collected are used to generate a meltdown curve as a percentage of the ice cream melted over time. The Asian base of a global food company was searching for a complete automation solution for the process.

This is a labor and time intensive procedure for the technician carrying out the analysis. The ice cream block must be carefully observed so that the precise time of the first melted drop can be recorded. However, this waiting period can be quite long. The subsequent weighing intervals must be carefully timed and the operator must record all the weight re-

The XS2002S offers the ideal capacity and readability for determining the meltdown rate of ice cream.

LabX automatically records all results against each unique ID.

Instructions are provided at each step of the process.

The final overall result is displayed and a report, including the meltdown curve, is generated automatically.
results manually. Transferring the results to a spreadsheet to generate the meltdown curve is also prone to transcription error. These difficulties are multiplied when attempting to determine the meltdown curves for several samples of ice cream simultaneously.

**LabX solution**

METTLER TOLEDO’s LabX Laboratory software is installed on the PC in the quality control laboratory. The balances in the lab are connected to the PC via the local network. In consultation with LabX Application Specialists, the customer’s application was implemented in LabX.

Lab technicians can then simply start the meltdown application with a shortcut button on the balance touchscreen – there’s no need to stand at the PC. LabX automatically records the time taken until the first drop is detected and the weight value every minute for the required length of time. These results are stored in a secure database against a unique ID for each ice cream sample. LabX generates the meltdown curve automatically and prints it out in a report at the end of the process.

**Sweet benefits**

This automated process, in partnership with LabX, simplifies the entire process for technicians and saves a considerable amount of time and money. There is no longer any need to manually record results, completely eliminating transcription errors. The technicians are also released to perform other tasks during the analysis, further increasing lab output and efficiency.

Several analyses can now be performed simultaneously without the previous risks or errors associated with interval-timing, recording of results or even missing the first drop. This meltdown application is designed specifically according to this customer’s needs giving quality control managers the reassurance that standard testing procedures are being appropriately adhered to and recorded.

[www.mt.com/labx](http://www.mt.com/labx)
Investigate Crystallization Behavior of Lactose in Milk Powder

Amorphous lactose is one of the main constituents of milk powder (powdered milk, dried milk) and is highly hygroscopic. If milk powder is stored in an open container, it becomes lumpy due to the uptake of moisture. The lactose present in milk powder can also crystallize as a result of increased water content. This can lead to changes in the flavor and taste of products containing the milk powder.

The behavior of lactose in milk powder can be investigated using the TGA-Sorption System. Due to processing conditions, the lactose present in all kinds of milk powder is in an amorphous state. Milk powders are, therefore, hygroscopic. The uptake of moisture can lower the glass transition temperature of the lactose to values below ambient temperature. The lactose then softens and the milk powder becomes lumpy. If the water content is sufficiently high, the lactose can also crystallize. This leads to changes in the taste and consistency of products in which milk powder is used. The influence of moisture on the glass transition temperature and the crystallization behavior of lactose in milk powder can be investigated by TGA-Sorption.

Experimental details
The experiments presented here were performed using a TGA/DSC 1 with a SDTA sensor in combination with a humidity generator (MHG, from Projekt Messtechnik). The sample was a random skimmed milk powder obtained from a supermarket. According to the data from the supplier, the milk powder contained 52% lactose. The sample mass used for all experiments was typically about 8 mg. In the sorption experiments, the humidified gas flow rate was 100 mL/min with the protective gas flow 5 mL/min.

To investigate the influence of moisture on the milk powder, a sorption experiment was performed at 27 °C. To do this, the relative humidity (RH) of the purge gas was continuously increased from 0% to 80% over a period of 1800 minutes. Before the actual sorption experiment, the sample was dried at 0% RH for 10 hours.

Results
The measurement curve obtained is presented in Figure 1. The curve shows that the uptake of water is initially slow but, after about 840 minutes, it increases noticeably. The sample mass then decreases after about 1320 minutes but increases again soon after.
This behavior can be explained as follows: The glass transition temperature of the lactose present in the milk powder is, at first, higher than the measurement temperature. As the water content of the sample increases, the glass transition temperature of the lactose decreases. When the glass transition temperature reaches the measurement temperature, the glass transition of the lactose occurs.

The increased mobility of the lactose molecules enables the lactose to absorb water more rapidly. The change in slope of the TGA curve, therefore, occurs at the water content at which the glass transition temperature of the lactose corresponds to the measurement temperature.

Furthermore, the increased mobility of the lactose molecules enables the lactose to crystallize. Since crystalline lactose is considerably less hygroscopic than amorphous lactose, excess water is released during crystallization.

This explains the decrease in sample mass. The peak maximum in the sorption curve consequently corresponds to the water content of the milk powder at which the spontaneous crystallization of the lactose begins.

[www.mt.com/TGA](http://www.mt.com/TGA)
Euro Cheese Stands for Cheese Excellence from Gouda to Mascarpone

Euro Cheese Vertriebs-GmbH is a 100% subsidiary of the new company Deutsches Milchkontor (DMK) which recently emerged from a merger of two large dairy companies. At its site in Altentreptow, the tasty cheese found on the cooling shelves of almost every discount market is produced.

Whether it’s mild or mature Gouda, Edam, full-fat cheese or Tilsit, the high quality standards apply to all cheese types. Checkweighers from Mettler-Toledo Garvens aid quality management in compliance with legal regulations.

The cheese specialist’s entire manufacturing and packaging process takes place in Altentreptow. „Our sophisticated quality management system and considerate approach to nature and its products are the foundations of our success“, says Holger Lewerenz, Production Manager for sliced products. „Our quality policy begins with our member farms and extends up to the marketing of finished products“, continues Lewerenz.

In the final packaging stage, a checkweigher from Mettler-Toledo Garvens, type XS3 CC H, checks the product weight of each pack of cheese.

Checkweighers check more than just the product weight

The XS3 CC H is a checkweigher coupled with a Safeline metal detector, which makes it the perfect tool for ensuring compliance with the HACCP regulations applicable to food production. This CombiChecker checks the product weight and detects any metallic foreign body in a single procedure.
Thanks to its compact design, it requires little space and ensures a high level of hygiene for cleaning staff. In addition, its rounded and sloping surfaces allow nowhere for dirt to accumulate. The XS3 CC H is also equipped with an intuitive 15” touchscreen display and user-friendly navigation aids. Both devices are operated via a single interface. Different user profiles ensure secure and easy access to the checkweigher and metal detector parameters. The metal detector has two working frequencies, and is therefore ideal for detecting traces of metal.

The XS3 CC H checks the product weight of all packs of cheese with a target weight of 400 g shortly after the cutting and packaging process. The checkweigher has a weighing accuracy of up to 500 mg. On this line, packs are checked at a rate of up to 160 pieces a minute. Underweight and overweight packs of cheese are safely removed from the packaging process with the aid of an air jet. The metal detector detects blade fragments, screws, metal shavings, staples, nails, filings or wire cuttings.

The Garvens XS3 CC H CombiChecker

- The checkweigher of the checkweigher and metal detector combination determines weights quickly and accurately, and any products with an incorrect weight are rejected.
- The metal detector detects products contaminated with metal such as screws, metal shavings, staples, nails, filings or wire cuttings, which are then also ejected.
- Just one user interface for both systems, which makes everything quicker and easier: user training, data entry, product changeover i.e. switching to a different product setup, and documenting the production quality.
- A variety of designs and data interfaces. All statistical data and production results can be made available in real-time for the local network.
- The compact design enables the simple integration of the system into an existing or new production line.
- The feedback control feature saves money by preventing overfilling, increases profit and at the same time ensures that consumers are not disappointed as a result of underfilling.
- Thanks to SQC/SPC software compatibility, line efficiency is increased and waste minimised.
- The weighcell’s principle of electromagnetic force compensation, also known as “EMFR”, ensures consistent accuracy throughout long periods and minimises the effects of ambient temperature and humidity on the weighing results.
- Hygienic design, optional protection against water up to IP69K.
- Robust, vibration-resistant design for maximum reliability.
- Continuously adjustable belt speed.
Packs containing metal particles are also ejected into a separate, lockable catch bin using an air jet. The metal detector in the combination system is a critical control point (CCP) for Deutsches Milchkontor GmbH, DMK for short, and therefore an important element of their quality management.

**Written documentation of the production processes is particularly important for quality management**

That’s why the XS3 CC H features a comprehensive reporting function, which can either be controlled and activated via the intuitive terminal or via an Ethernet network connection on the PC.

"100% checking of our products is extremely important to us", explains Holger Lewerenz. "A checkweigher not only reduces the use of raw ingredients, but also enables us to optimise our production processes." concludes Holger Lewerenz.

**The XS3 is a weighing solution for products weighing up to 6000g**

Back to cheese production. A checkweigher from Mettler-Toledo Garvens also performs checks in the line carrying 250 g packs at Euro Cheese. The Garvens XS3 is a compact weighing solution for products weighing up to 6000 g. This checkweigher is also characterised by easy user operation via a touchscreen display. Thanks to its steplessly adjustable belt speed, it can be easily integrated into existing production lines. Variable transport height adjustment is also included in the standard in addition to direction of travel changeover and stepless speed control.

This checkweigher covers up to 7 weight classes. This is of particular interest to a company such as Euro Cheese with a wide range of products. This checkweigher enables fast product changeovers and thereby reduces set-up times.

The Signature metal detector from Mettler-Toledo Safeline ensures that products are free from foreign bodies. The Signature technology guarantees maximum detection sensitivity in inline detection. Even the smallest metallic foreign bodies made of non-magnetic stainless steel and thin pieces of wire are reliably detected. Defective products are ejected from this line with the help of two tandem blower nozzles, which sort underweight or contaminated products into two separate catch bins with a strong blast of air pressure.

At this point too, the Safeline Signature is a CCP – critical control point – and also an element of the quality concept at DMK.

Top level documentation of production that complies with the stringent European quality standards is a prerequisite for the international success of Euro Cheese.
The Altentreptow site is certified according to ISO 9001:2000, the International Food Standard (IFS) and the BRC directive.

METTLER TOLEDO offers a full range of inline checking solutions, i.e. checkweighers, metal detectors, X-ray inspection technology and optical inspection equipment. In addition to high-quality product inspection solutions, METTLER TOLEDO excels thanks to its extensive, worldwide service network. This makes METTLER TOLEDO the perfect partner for quality-conscious companies with high quality demands such as DMK Deutsche Milchkontor GmbH (DMK).

www.mt.com/checkweighing

DMK Deutsches Milchkontor GmbH (DMK):
- Humana Milchindustrie GmbH and NORDMILCH GmbH have joined forces to become the German dairy industry’s number one player: DMK Deutsches Milchkontor GmbH, or DMK for short. DMK means 6.8 billion kilos of milk delivered by more than 11,000 milk producers and processed at 23 factories by around 5,500 employees — their site in Altentreptow is where Euro Cheese, a 100% subsidiary of DMK, produces cheese.
- The company’s strength in the field of cheese is its customer-oriented full product range, high volume availability and individually tailored packaging concepts.
- The company sells cheese products under the brands MILRAM, OLDENBURGER, Golden Cheese and Casarelli. Private brands also make up a significant proportion of sales.
- In addition to the classic range for retail trade, the company DMK also offers a comprehensive range of industrial products, designed specifically for industrial partners and their requirements from the various sectors of the food processing and producing industry.
- At the heart of the range produced by the DMK subsidiary Euro Cheese in Altentreptow are 15 kg foil-matured blocks of cheese which are packaged according to customer requirements, usage and production conditions, both in terms of the packaging material and the logistical equipment used.
Traceability for Consumer Safety and Process Improvement

Ice cream is one of the most consistently popular products in the dairy industry, driving the creation of novelty products and a variety of flavor. With so many innovative flavors—each requiring its own unique look and, for some products, allergy warnings, it is important to ensure the proper label on each container. As the industry continues to grow, manufacturers need to find ways to increase their production output while also strengthening their quality control processes.

Manufacturers Turn to Vision Inspection

Traditionally, quality control methods have slowed considerably the production process.

Manual inspection taking place on the line requires a slower production speed. As a result, more manufacturers are turning to machine vision inspection as a way of increasing quality control without sacrificing production speeds. Unlike manual inspectors, vision systems do not require time off.

Both container manufacturers and ice cream manufacturers have sought a better way to prevent labeling errors. After researching available options, one manufacturer decided to investigate vision inspection as a quality control solution.

METTLER TOLEDO offered a trial V6300 vision inspection system to the manufacturer after evaluating the product, confident in the system’s ability to quickly detect and remove mislabeling. By the end of the trial period, the manufacturer was so pleased with the performance of the V6300 they elected to install the system on all production lines in the facility. Within the first twelve months of installation, the system has already detected and prevented several labeling mishaps, which otherwise could have resulted in a recall or worse.

Methodology

To prevent mislabeling, the V6300 looks for particular graphical or textual elements unique to each container. In this
case, the system uses two cameras to view the label on the front of the container and on the lid, performing the same label verification inspection on each and confirming they match. Pre-loaded on to the system is a profile for each ice cream flavor, this includes an image of an ideal container as well as the particular inspections to be performed.

The system first locates the container in the image and identifies the marking on the package—for this application, the V6300 looks for the flavor of ice cream. By locating the container on the image before attempting further inspections, the system is able to compensate for material handling variations. If the marking on the inspection image matches the marking on the trained image, then the system knows the correct package is present.

Should the inspection image fail to match the trained image, the system transmits a signal to a rejection mechanism, automatically removing the mislabeled container from the line. Should the system detect multiple consecutive failures, it alerts operators and can send shutdown signals to the production line in order to prevent further mislabeling from occurring. This greatly reduces the possible rework required.

**More Than Mislabeling**
After using the V6300, the manufacturer realized that the system could be used to perform other inspections for which the system was well suited. In addition to preventing mislabeling, the V6300 is able to identify poorly place labels, misaligned closures and verify the integrity of tamper evident devices. The expandable nature of the V6300 allows the system to perform new inspections as manufacturers decide to perform them—if a new inspection would require additional cameras or equipment, they can be added to the existing system.

**Ongoing Support**
Even as the V6300 performs well on the manufacturing line, METTLER TOLEDO continues to offer full support to this customer in the event of any unforeseen troubles. As the manufacturer discovers the benefits of vision inspection system ownership, other plants are taking notice of the increased quality of their products and efficiency of their processes; making METTLER TOLEDO a preferred choice for this dairy manufacturer.

Ensuring Product Safety on an Ice Cream Production Line

Ice cream! One of the world’s simplest and purest taste experiences. Since its introduction to Europe many centuries ago by travellers from Asia and the Middle-East (and not Marco Polo as often assumed), ice cream has become one of the continent’s most coveted sweet treats.

Despite its simple and affordable nature, the manufacturing of ice cream is a sophisticated and highly industrial science today, with factories producing millions of litres of multiple types of ice cream to then be shipped to the far corners of the continent.

This industrialisation has helped ice cream to win its dominant place in the hearts of many consumers, but can also throw up challenges in terms of detecting foreign bodies.

In this case study we look at how one company in particular has turned to advanced product inspection technologies to ensure that any ice cream produced in its plant is in perfect condition for the consumer’s simple enjoyment.

The Dream Factory
In the town of St. Dizier, in France’s eastern agriculture pastures, is where many of Europe’s favourite brands of ice cream are produced. Miko, France’s leading producer of frozen creams and sorbets and a key European ice cream player, has been creating such family favourites as Viennetta, Cornetto and Solero in its factory there since the start of the 20th century.

The company was acquired by Unilever in 1994, and now services retailers across Europe, ensuring that its ice cream fridges are filled to the brim. The plant itself has six production lines, three for ice cream cones and individual frozen bars and ices, and three for ice cream.
tubs, produced in 0.75, 1 and 1.5 litre formats. Highly efficient, the lines can handle throughputs of up to 1,500 tubs per minute, with the factory pumping out a mouth-watering 85 million litres of ice cream per year.

With such a high volume of products being produced and dispatched to retailers across the region, Miko has always known that product safety is hugely important, both for its consumers and for the company’s reputation. To control product quality, Miko has long worked with Mettler-Toledo Garvens, a business unit of Mettler-Toledo, who installed a series of XS3 checkweighers to test products during processing and packaging stages.

Seeking to further reinforce positive customer experiences, the company recently set itself the challenge of minimising the already small risk of foreign body contamination to further reduce the number of customer complaints it received. The target was a 20 per cent drop in client reclamations overall by 2014.

A Solid Challenge
Leading the project for Miko was Project Manager, Antoine Bille, who had the responsibility of finding the solution that would enable the company to hit its ambitious goal.

“I was given complete freedom with this project to find a way to hit our target. At Miko, we have a responsibility to our customers to ensure that our ice cream products are perfect when they reach them”.

To initiate the project, Antoine focussed on the Carte D’Or® ice cream tub lines, researching whether the risk of product contamination was primarily metal pieces, or if other contaminants could be involved as well. Once he established that there was also a small risk of glass, mineral stone or metal fragment contamination, it became clear that the product inspection solution must be capable of detecting a wide range of foreign bodies.

The technology would also need to offer sophisticated and variable product inspection analysis of the products being checked to avoid false rejects when checking fruit sorbets with large chunks of soft fruit or mistaking small hard chips of chocolate for a contaminant.

A final piece to the puzzle would be the requirement that products could be inspected at varying levels of solidity, as some might have begun to defrost on the conveyor.
Sweet Solution

Following discussions with colleagues in other sections of Unilever, and product inspection partners such as Mettler-Toledo, it became clear to Antoine that a sophisticated contaminant detection system from the division’s x-ray business unit would meet his business requirements while being able to detect all types of contaminants.

Mettler-Toledo Safeline X-ray’s InspireX2, designed for high-speed multi-lane applications and able to detect contaminants as small as 0.8mm, such as glass, metal, mineral stone and high density plastic, ticked all the boxes.

In addition to detection of contaminants, the x-ray system incorporates a range of quality control measures to help minimise waste and reduce costs. It performs both gross and zoned mass measurements for portion control, while scanning for products which are damaged or have product missing. At the same time, it ensures product freshness by checking seal integrities.

For Antoine, the key to the project’s success was not just finding the right solution, but ensuring that it was tailored to the company’s needs.

To achieve this, Mettler-Toledo Safeline X-ray’s experts worked closely with Antoine and his peers, overseeing the installation and commissioning process. During the installation process, Mettler-Toledo Safeline X-ray revamped the machine’s rejection system to harmonise it with the speed of the line.

The machine was also customised to cope with the harsh environment it would work under when handling ice cream, such as freezing and wet conditions. This entailed the addition of a special lagged drive roller to increase drive grip, preventing the entry belt from slipping, and a pivoted belt scraper to clean any spillages from the belt.

In addition to the optimised product safety provided by the new x-ray system, Antoine was particularly pleased with the ease of use of the touchscreen human machine interface (HMI) for machine operatives.

“Our team really value the HMI as it provides the opportunity to recover all the data on the line quickly and easily when we need it. We are able to access all data on the quality of our products and the number of rejections at regular intervals for analysis and action if necessary”.

The Proof is in the Ice Cream

Following such an extensive project, Antoine was delighted to see strong positive results quickly emerge. The installation of the InspireX2 has helped Miko hit its target, with complaints about contaminants from customers reduced by 20 per cent more than one year ahead of schedule.
In fact, the project worked so well that the company has since installed a combination AdvanCheK X-ray and XS3 checkweighing system for the lines producing cones and individual ices. As Antoine explained, “With Mettler-Toledo Safeline X-ray, we were able to beat our original deadline, and see a real increase in quality control for our products.

More than anything, it was their willingness to adapt the x-ray machine to our needs that ensured the success of this project and encouraged us to invest in another machine”.

www.mt.com/safeline-xray
Food Safety Starts in the Production Process

Water reclaimed from dairy products can be re-used for potable water purposes in dairy production if its purity is high enough. An in-line turbidity measurement can help you to optimize your process water distribution system.

A Household Name
Our customer is one of the world’s largest companies in the food industry. Their portfolio spreads from human to animal food and they are well known for their health awareness.

Re-use of Condensate
Water extracted from dairy products - e.g. condensate from evaporators - can be re-used in different ways depending on the purity of the water.

It can be used either in boiler feed, Clean-in-Place applications, or in potable water purposes including the production of culinary steam (1). For the latter the water quality must be high enough and must be controlled by analysis of grabbed samples including an off-line turbidity measurement for the detection of suspended or emulsified substances. Our customer decided to install a METTLER TOLEDO in-line turbidity measuring system. Such a process analytical instrument provides continuous and immediate results and becomes part of an automatic fail-safe monitoring device, located in the reclaimed water line prior to the storage vessel.

This whole system is used to monitor and automatically divert to the sewer or a water purification plant, any water that exceeds the turbidity standard by five turbidity units.
METTLER TOLEDO’s Solution

The InPro 8600 in-line turbidity sensor is the perfect way of monitoring the quality of reclaimed water including the purity of condensate.

It is designed for in-line measurements directly in reclaimed water lines, it is easy to install and withstands temperatures up to 100 °C (212 °F). The measurement system is completed with an M800 transmitter which can be easily integrated into an existing process control hardware and software environment.

Lower Costs – Higher Safety

Our customer is delighted with the performance of the METTLER TOLEDO system thanks to its reliable and maintenance friendly operation. This has both lowered their operational costs for process water management and brought product safety related benefits.

Additionally, process downtime has been reduced thanks to the continuous and immediate availability of turbidity analysis in reclaimed water lines.

Instrument overview

- Optical sensor based on scattered light technology
- Hygienic sensor design
- Standard process connection for easy installation
- User-friendly transmitter and maintenance operation

Literature:
Hieber’s Frische Center
Success with Style

Hieber’s EDEKA markets are customer-friendly worlds of shopping experience with a seamless offering of products. In the newest Hieber market, from the outset: Self-service and counter scales from the UC Evo Line from METTLER TOLEDO.

In October 2011 Hieber’s Frische Center opened its most modern market in Bad Krozingen. The name Hieber makes the following mandatory: Customers move through clearly configured product worlds and experience an absolutely first-class presentation of goods in every assortment. In the center of the shopping experience are the assortment of fresh foods and domestic products.

The modern store scales from the METTLER TOLEDO UC Evo line, with their sleek design and black color, fit the scenery perfectly and send a signal for quality at the point-of-sale. Through the customer screens of the scales, Hieber communicates understated and up-to-date information about events, and in this way strengthens customer loyalty.

In the 2,300 square meter market in Bad Krozingen, the team surrounding Dieter Hieber is fully behind METTLER TOLEDO scales. At the deli counter with sections for meat, cold cuts, cheese and fish, nine UC-HTT-M touch screen scales ensure rapid processing. In the produce section, three UC-GTT-M self-service scales are available for use. In addition, Hieber ordered three UC-GTT-M scales for prepackaging in the bakery and fresh prepared convenience products.

“There is no fixed Hieber concept that we simply apply to every market,” said Norbert Schoeffel, co-manager at Hieber’s Frische Center. “When there is a new store opening, we are always starting with a blank sheet of paper. This way, we stay in step with current trends. Fixed principles set the general direction: Elaborate mazes of shelves, customer stopper displays, check-out line product racks — anything that could be bothersome is not found at Hieber’s.

The customer can expect a stress-free and pleasant shopping experience with low shelves, wide aisles and a compelling assortment including many local and regional specialties.
**Good appearance**

Customer orientation and good design – the precepts fit the UC Evo Line. Norbert Schoeffel, responsible for purchasing at Hieber, especially appreciates the slender design of the scales: “No bulky housing, which could maybe get in the way of visual contact between sales personnel and customers at the counter.” Instead, understated, narrow shapes and at the same time very legible displays.

A particular concern for the Hieber customer’s advice: The scales must meet all criteria of a multi-generation-friendly supermarket. METTLER TOLEDO has therefore configured the self-service scales for Bad Krozingen in such a way that especially large control panels are displayed on the touch screens. The product identification is done quickly and conveniently by fingertip entry of numbers.

All scales have PC technology and are linked with the EDEKA-ERP system EBUS/WIN. Articles catalog data can be obtained directly from EDEKA central office – including much additional information on, for example, ingredients, nutritional values and allergens. The Hieber sales staff has these data at their fingertips on the scale and can also advise customers on detailed questions without making them wait.

Incorporated in the inventory system

The same applies for supplying scales with content for visual sales promotion. The area of digital signage is not new territory for Hieber. Many of its markets already have large digital signage screens, on which current dates and information surrounding the Hieber purchasing experience are communicated. Thanks to the open interfaces of the UC Evo Line, it was easy to tie the new scales into the inventory system. Norbet Schoeffel: “The customer displays of the scales appear there simply as an additional screen. It could not get any more practical.”

**Fans rather than customers**

The team around Dieter Hieber is consciously eschewing offensive and price-focused product advertising. “Our assortment speaks for itself,” said Schoeffel. “We use the scale screens to bring our customers close to the many service offerings and activities surrounding the Hieber brand. This includes our wine tasting evenings, the Hieber Club or information about our social engagement. With the slide show on the scales we reach our customers during wait times without distracting them from their shopping. “In this way, we quickly turn Hieber customers into genuine fans — and they are glad to come back.” Like an expert panel of judges for the award “Store of the Year.” With the market in Bad Krozingen, Hieber’s Frische Center is already winning the retail “Oscar” for the second time.

Further information can be found at:

[www.mt.com/retail-evoline](http://www.mt.com/retail-evoline)
Tank, Silo and Conveyor Weighing
Get an Extra Portion of Safety

The SWC515 PINMOUNT weigh module combines precision weighing and easy installation with an unusual high level of safety.

With the SWC515 PINMOUNT weigh module you can convert tanks, silos, mixers or conveyors into high precision weighing systems. The symmetric design provides redundant safety features like 360° checking, ensuring installation errors are minimized. Further features include dual lift-off protection to cope with wind forces, dual drop-down stop to cope with even the worst cases of dropping and optional dual stabilizers suitable where dynamic side loads occur for example in mixers and conveyors.

The product is available in 304 stainless steel and the built-in load cell has IP68 protection making it ideal for food applications and other heavy cleaning requirements.

The compact design and low weight (23 kg) allow for quick installation. As the weigh module can be fully loaded without load cell in place additional protection of the load cell while installation is provided.

**Key customer benefits**
- High level of safety due to redundant features
- Precise process control through approved rocker pin load cell
- Installation savings through compact design and load cell protection

**Fast facts SWC515 PINMOUNT**
- 360° horizontal checking
- Redundant safety features
- Dual optional stabilizers for dynamic scales
- Capacity range 7.5 t–22.5 t
- OIML 3000e, NTEP 6000d
- ATEX, FM approval as standard
- Stainless or zinc plated hardware
- IP68 protected load cell
Access Information and Know-how
On www.mt.com

Technology guides and Know-How
We provide comprehensive insight information on how our solutions and services help meet global food safety regulations and increase food safety, quality and productivity.

- www.mt.com/ind-food-productivity-guide
- www.mt.com/pi-guides
- www.mt.com/lab-foodandbeverage
- www.mt.com/retail-foodsafety

Application Literature
We offer comprehensive application support for all of our solutions. Our titration application database alone holds 200 applications for the food and beverage industry.

- www.mt.com/moisture
- www.mt.com/titration_applications

Webinars
METTLER TOLEDO offers a wide array of live and on-demand web-based seminars (webinars). Obtain specific information about best practice and latest news on applications, products, industry trends and standards.

- www.mt.com/food-webinars

www.mt.com/dairy
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